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John Hunter was born 200 years ago, on Valentine's Eve or Day of 1728, at his father's farm near Glasgow. Youngest of a family of ten, he disliked school, hated books, lived in the open fields as far as was possible, studied animal life, especially birds and insects, "mucked about" (pardon the slang; there is no other appropriate expression for it) his father's farm, was apprenticed for a time to a relative, a timber merchant and cabinet maker, and with that odd equipment turned up in London at the age of 20 to assist an elder brother William, who was at that time conducting a successful anatomy school in London. Of that school much has been written, for formal education in anatomy in Great Britain had its foundation there, but just before the bicentenary celebrations in honour of John Hunter, which took place in London last February, through the mediation of that famous disciple of Hunter, Sir Arthur Keith, and the generosity of Dr. Louisa Hamilton, there came into the possession of THE LANCET a series of letters which describe from a contemporary pen the life of the Hunters at the time when this school was at the zenith of its work. The letters were written by Dr. Louisa Hamilton's ancestor, William Hamilton, to his father, Thomas Hamilton, professor of anatomy in the University of Glasgow, and a friend of the Hunter family. The fact that the Hunters were friends of the Hamiltons in itself indicates that John Hunter's father was in association with one of the most brilliant of Scottish intellectual clans; for these were the Hamiltons, three of whom were professors of anatomy in the University of Glasgow, and one of whom, Sir William Hamilton, was the philosopher of world-fame. Sir William Hamilton's grandfather, Thomas Hamilton, professor of anatomy in the University of Glasgow in 1751, was a fellow student of John Hunter, though his senior, and rode with John when he proceeded on horseback to join William Hunter in London in September, 1748. Later—namely, in 1777—William Hamilton followed in the footsteps of his father, coming to London to study with both William and John Hunter, and the charming and informative letters which William then wrote to his parents tell an intimate story of the social milieu in which the Hunters lived, as well as indicate the absorbing way in which the anatomical studies of the school were pursued. The indication may be slight, but the picture which they draw is clear.

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Until he was just over 30 years of age John Hunter remained an anatomical assistant in his brother's medical school. William Hunter was, in particular, a great teacher, but he seems to have come the senior over John in an unfair way, though it must not be forgotten that he had absolutely supported him. Anyhow, John, while William's assistant, traced the descent of the testis in the fœtus and made discoveries as to the nature of the placental circulation, which William later claimed as his own, apparently because they were done in his school. It was clearly time that the brothers parted, and in 1759 symptoms of lung trouble manifested themselves in John, who was always a physically delicate man. Now this was a misfortune which in the event was a blessing. For it led to John Hunter applying for a staff appointment in connexion with some military and naval operations being conducted off the coast of France—what is known as the Seven Years' War being in course of decision. Hunter was stationed at Belle Isle, and later in Portugal, using his opportunities to make assiduous and first-hand observations on the anatomy and physiology of sea birds, fishes, and all marine zoology along its lower planes, while at the same time he acquired a knowledge of military surgery as understood at that epoch, studied the conditions of the coagulation of the blood, and probably made his first investigations as to the state among certain animals of hibernisation. It was during this period presumably that he started his wonderful collection.

INDEPENDENCE.

At the close of the Seven Years' War he returned to London with a certain amount of half-pay and a marvellous store of unrecorded wisdom to rely upon for a professional livelihood, while he had increased his responsibilities by an engagement to Anne Home, the daughter of one of his superior officers. He decided to teach anatomy while building up a surgical practice. He started to teach and to practise in Golden-square, a square almost adjoining Regent-street (though so difficult to find) which was at that time a residential district; and although there seems to be no evidence that he made any particular mark at once, he was able in the course of five years to find the money for the purchase of the lease of some land in the neighbourhood of what is now known as the Earl's Court-road, where he built a house. This was in 1765, but it was not until 1771 that he seems to have found time to marry Anne Home. In the meanwhile he took resident pupils in Golden-square, held anatomy classes, practised as a surgeon, and continued to

collect specimens. It was at this epoch that he secured the refusal of the carcasses of all the animals dying in the menagerie then attached to the Tower of London, and as the menagerie was placed in the fosse around the walls of the Tower it seems likely that the death-rate among the beasts was a high one. In one of the lives of Hunter—Oldrey's probably—we find it related that he gave £5 for a dying tiger and had to borrow the money from a bookseller, an anecdote which confirms the statement of Sir Everard Home that Hunter always kept himself penniless by disbursing all that he gained upon his collection. But Home's criticism of his brother-in-law does not consort with the facts that in 1765 Hunter should have been able to carry out such a financial transaction as that at Earl's Court, while in 1768 he moved from Golden-square into a large house in Jermyn-street. He must have been making a substantial income as a surgeon, or his profuse purchases would have drained his resources, but the move to Jermyn-street was quite probably a wise financial action, giving him more space in which to accommodate house pupils. For he was able to charge what was in those days the large sum of 500 guineas for the privilege of apprenticeship to himself, and it was in Jermyn-street that he received a pupil whose name is as widely known as his own—namely, Edward Jenner. In this way Hunter and Jenner came to be eternal ornaments to my hospital, St. George's.

Hunter's life at Earl's Court is the clue to his personality—it was one long exposition of his quality of an insatiable curiosity. It was the life of the curator of the most remarkable menagerie the world has ever seen, assembled in order that the inmates should give up to their owner the secrets of their lives, the reasons for their being. Mammals, birds, fishes, and reptiles—ranging from buffaloes and eagles to lizards and eels—were there collected, bred, experimentally treated, and cross-fertilised where possible. He transplanted the spurs of his cocks into their combs; he fed swine with dyes till their bones were coloured; and every living thing under his care was watched in its periods of health, development, and pathological attack that it might answer some pertinent question in physiology. Dogs and jackals, horses and zebras were mated with a view to the solution of problems of fertilisation and hybridisation; his early studies in aquatic zoology were continued in ponds specially dug to receive fish, frogs, leeches, and especially eels, whose life-history he perceived to be mysterious; in vaults or dens he kept his larger beasts, and seems to have been fearless in his management of them.

From Structure to Function.

Some of the multifarious directions whither Hunter's grand curiosity led him are revealed in a profuse correspondence which took place between him and his famous pupil, Edward Jenner—a pupil after his own heart. Nothing was known or even suspected during Hunter's life of what we should now describe as the phenomena of immunity, nor was Jenner's first inoculation as a treatment for small-pox performed until three years after Hunter's death, but Hunter recognised in Jenner a kindred spirit. Jenner became Hunter's intimate friend despite the fact that he was by 20 years the younger man, and it was to Jenner, practising in Gloucestershire, that Hunter wrote from his "country" menagerie—it is significant of the spread of London that Hunter always alluded to Earl's Court as being in the country while it is now in the inner zone of the metropolis—outlining his doubts and asking for specimens to help him in their elucidation. In the Vicary Lecture delivered in Lincoln's Inn last February, during the Hunter bicentenary celebrations in London, Dr. Peachey gave some interesting extracts from Hunter's letters to Jenner, and as Baron's life of Jenner is now, I understand, difficult to obtain, I refer you to Peachey's lecture for the following quotation: Hunter keeps on asking for information as to the habits of the cuckoo and the breeding of toads, and continues: "If you collect eggs you should also collect the nests; I want a crow's nest, also a magpie's in the branches where they are built. I want a nest with the cuckoo's eggs in it, also one with a young cuckoo, also an old cuckoo. I hear you say there is no end to your wants." Again, he writes: "I thank you for your experiment on the hedgehog, try its heat and let me know the result. . . . You do not mention a word about bats. Have you got the bones yet of a large porpoise? Is ever the salmon spawn seen after she has parted with it? I will take any specimen of fossils you may send me, or indeed anything else. What do you think of examining eels? Their sexes have not yet been found out, nor their mode of propagation." In the spring of 1778 he was asking for more hedgehogs: "All that you sent me have died, so that I am hedgehog-less." And then in one letter, after referring to some amatory disappointment suffered by Jenner, he adds: "Let her go; never mind her. I shall employ you with hedgehogs." This random series of questions covers, it will be seen, a huge range of physiology, some of which later will have application in the actual practice of surgery. It is easy to see what fundamental possibilities for physiological research lie beneath the demand for information as to the temperature of the hedgehog. For the hedgehog is an animal which is for part of its life homothermal, maintaining a uniform body temperature, and for part of its life—namely, that spent in hibernisation—poikilothermal, having a variable body temperature corresponding to the environment. But how Jenner made the actual observations and how Hunter checked them with the kind of instrument that Fahrenheit had recently invented I cannot surmise, and I must not pose as a student of Hunter's original writings. He was, as you might expect from a man of no academic training, a bad and obscure writer, while his observations were largely made in scattered notes. It is quite possible that no notes on the matter exist; it is sadly probable that they were destroyed, for, it is well known that Sir Everard Home burnt a large quantity of his brother-in-law's manuscripts.

Now see where all this was tending and how it came about that Hunter while inventing comparative anatomy should also have become the father of modern surgery. All the questions in respect of propagation among fish, of vital processes among hibernisers, and of the domestic habits of birds point to the intention to find some common law of life by which the normal and the abnormal, as manifested in everything that lives, moves, and has its being might be interpreted. What we call physiology was in Hunter's days non-existent for the student. Hunter's lifelong and intense experience as a dissector and teacher of anatomy made him realise that every advance in his knowledge of structure ought to be associated with some fuller comprehension of function. Alterations in structure which he observed as regulated by the age, sex, or development of the subject, and equally so by morbid changes in the subject, ought, he felt, to be explained by some general laws of life. This collector of specimens, whose interest seemed directed with equal passion towards newts and buffaloes, eels and leopards, giants and dwarfs, was almost unconsciously working on a central plan, while his interrogatories to himself and to his friends were so heterogeneous and so apparently disconnected. He was acquiring a new knowledge of physiological processes as they occurred or might occur in man, by drawing upon the lessons derived from his persistent observation of similar processes in animal and sometimes vegetable life. The time came when he felt that some pattern of life was regulating his observations of structural, physiological, or pathological phenomena. This he alluded to as the vital principle, which he conceived of as being something, to use his own words, "superadded to matter, a property we do not understand; we can only see the necessary steps to it." In a sense we may be said at the present day to have advanced not much further than Hunter. What we have done is to follow Hunter's lines in the attempt to elucidate this "property that we do not understand." As we have advanced, difficulties

not conceived of by Hunter have arisen. His conceptions were entirely mechanistic, and it is now fairly universally admitted that mechanistic explanations are insufficient, the arena of dispute being the place at which something more than a mechanistic solution is called for.

HARVEY, HUNTER, AND LISTER.

But what Hunter did is so wonderful that any attempt to comment fairly upon it in a few words must be inadequate, and we need spend no time in discussing whither his philosophy might have led him if he were still with us. The essential outcome of his work was practical, and that is why he is the father of modern surgery; and the range over which his teaching had a practical bearing was so vast that, if for this quality only, he takes his place with Harvey and Lister.

Harvey's work was as concentrated as Hunter's was diffuse. Harvey was for many years of his life absorbed in the elucidation of one problem—the greatest problem in all physiology it may be granted, but for its solution the necessary wisdom was likely to be of a concentrated sort. It was, indeed, probable—and so it proved in the event—that much of the necessary evidence was already in the possession of the initiated, what was required being the sifting and marshalling of that evidence so that it should demonstrate the truth. In doing this Harvey was triumphantly successful in what has been described by Sir Arthur Keith as the finest piece of detective work that science can show, and the perfection of that work is perhaps best manifested by the researcher's necessity to assume the existence of structures which were hidden from the naked eye until after Harvey's death. No general curiosity would have assisted Harvey; indulgence in it might only have served to divert his attention from the central problem. That his discovery, by revolutionising all conceptions of physiology, had an importance ranging further than anything Hunter ever accomplished was due to its nature and not to Harvey's individual conceptions. Yet nothing that Hunter ever did would have had any meaning if Harvey had not supplied the sound physiological basis for the work.

Lister again was as concentrated in his work as Hunter was diffuse. The fact that Lister's immense discovery had as far-ranging an influence over the comprehension of disease as Harvey's discovery had over the comprehension of physiology was due to the nature of the discovery and not to the discoverer's conceptions of his work. Lister, like Harvey, was a highly educated man, both generally, and specially for the task which he set himself, and that task was, in its original shape, to prove that by precautions against infection the mortality in certain cases of disease or injury could be prevented. By endless pains directed to that end he achieved his purpose and lived to see the limitless boon which he had conferred upon mankind in directions which he could not have foreseen. No general curiosity as to the laws of life would have advanced his researches immediately.

Hunter was the middle term. Without Harvey's discovery all the wide-ranging physiological researches, as far as they could have been conducted, would have been radically wrong in conception, even though occasionally correct in deduction, and many of the researches would never have been attempted. For example, without a right knowledge of the physics of the circulation of the blood how could Hunter have transformed his observations on the blood-supply of the antler's velvet into comprehension of the possibilities of collateral circulation in the human subject, with its results, the devising of a radical cure for aneurysm? And in a similar way the whole of Hunter's original surgical work was based, we can assume safely, upon his own physiological studies, as he departed more and more from the traditional teachings of his day. How great the expansion of clinical surgery was under Hunter's teaching is best gathered from reading the treatise on surgery by his devout disciple, Abernethy. This treatise, in its original shape, was largely a reprint of Abernethy's lectures to his classes at St. Bartholomew's Hospital, which were printed in THE LANCET in defiance of the lecturer's prohibition. The proceeding on the part of the Founder of THE LANCET was denounced by the leaders of medicine as a deed of flat piracy, and hailed by the rank and file of the profession as a proper spreading of the gospel improperly withheld from them. The reporting of the lectures became the subject of furious action in law-courts, and the dispute was finally decided in Wakley's favour—to become, I believe, a leading precedent. It is a curious reflection that it should be easier to follow Hunter's teaching through the medium of his disciple than through his own words—it was the one ill-result of John Hunter's defective education that he was an ineffective writer—but the literary work that he had in view, and died without accomplishment, was surely an all-round treatise on comparative anatomy, and not a resumed application of his multifarious wisdom directed to clinical surgery. Of such a work the catalogue of his marvellous museum would have formed the backbone; already the skeleton existed, and much of the material wherewith to clothe the bones had been actually written and rewritten in obedience to the unquenchable curiosity that kept him ever questioning—when death removed the author and a malignant fate consigned his manuscripts to treacherous hands.

If Hunter's theories, researches, experiments, and results would have been impossible or vitiated, or minimised without the sure foundation of the "De Motu Cordis," published precisely 100 years before Hunter was born, so Lister's work, which took definite shape some 70 years after Hunter's death would have been of infinitely less significance without the progress in surgical science initiated by Hunter and developed with the discovery of anæsthesia. Failing these things, the application of Lister's theories must have been sadly smaller at first, for many of the situations where the combating of sepsis was the key to the relief of symptoms and perhaps to the cure of the patient would never have presented themselves to the surgeon.

THE WISDOM OF THE CHILD.

Gentlemen, I hope that you will agree with me in finding that the leading characteristic of John Hunter was his grand curiosity—and how should it have been otherwise? Where could he have derived lessons from, what accepted wisdom could he have imbibed and from what sources, when he was inventing his science, as he went along, and knew not where his imaginings and their progressive realisations were leading him? Hunter's was the wisdom of the child who has the new game of life before him, knowing neither the rules nor the chances, but who learns to follow the first and meet the second by perpetually asking What? and Why?

It is out of no disrespect to you, Sirs, that I make my oration so brief; I anticipate your gratitude for my brevity. It has seemed to me that we should be paying higher honours to Hunter if, instead of familiarising, or refamiliarising, ourselves with biographical details we considered one salient quality in his character which, in my humble belief, was the quality which counted first in all that he did.

The rise from kail-yard peasant to world-famed philosopher; the life of piquant happenings; the self-infection with the disease whose pathology he expounded and whose sequelæ were fatal to him; the dramatic death within the walls of St. George's Hospital (the scene of his clinical triumphs); the holocaust made of his manuscripts by a trusted relative; the exhumation of his bones for burial in Westminster Abbey—all these things I know that you know of, and I have spared you their repetition, in order that I might ask you to regard this sensational figure in medical history as a child. But what a child! For he exercised his grand curiosity on the Maker of all things, demanding of Him, from the evidence supplied by His creations, what was the plan upon which He was working. Surely a Grand Curiosity.

JEJUNAL AND GASTRO-JEJUNAL ULCERS.

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I.* *Ætiology and Pathology.*

Frequency.—The frequency with which the operation of gastro-intestinal anastomosis is followed by peptic ulceration in the neighbourhood of the stoma depends chiefly on the nature of the disease for which the operation has been performed. Almost unknown after gastro-jejunostomy for cancer, and occurring but rarely in cases of simple gastric ulcer, jejunal ulcer is a frequent and dangerous sequel of gastro-jejunostomy for duodenal ulcer. The frequency, in short, varies directly with the hydrochloric acid content of the gastric juice, and is a measure of the ætiological importance of hyperchlorhydria in its production. Judd states that up to 1921 only one case of jejunal ulcer following resection of gastric carcinoma had been observed in the Mayo Clinic. The fact that patients with carcinoma of the stomach rarely survive the palliative operation of gastro-jejunostomy for any length of time no doubt partly accounts for this immunity, but it is equally certain that the diminished free hydrochloric acid content of the gastric juice, which is generally present, plays at least as important a part. In cases which survive gastrectomy the extensive resections carried out render the possibility of peptic action on the jejunal wall still more remote.

In cases of simple ulcer of the stomach, in which normal or subacid values are the rule, gastro-jejunostomy is rarely followed by jejunal ulcer. In a series of 10,300 post-mortems at Leeds there were 12 cases in which periods varying from six months to 18 years had elapsed since a gastro-jejunostomy had been performed for gastric ulcer; in none was jejunal ulcer present, but in three there was recurrent ulceration in the stomach. In the New Lodge Clinic series there was only one case of anastomotic ulcer following an operation for gastric ulcer. At the Mayo Clinic Balfour (1925) found that jejunal ulcer was 20 times more common after gastro-jejunostomy for duodenal ulcer than when the same operation had been performed for gastric ulcer. There is no doubt that the trivial incidence of jejunal ulcer reported in the earlier days of gastro-jejunostomy was partly due to the fact that most of the patients operated on at that time were the subjects of gastric ulcer or its sequelæ.

In duodenal ulcer, with its associated hyperchlorhydria, an anastomotic ulcer is a frequent complication of gastro-jejunostomy. The precise incidence is not easily determined. There is general agreement among surgeons that it is in the neighbourhood of 1 or 2 per cent. (Moynihan 1923, Judd 1921, von Eiselsberg 1914), but the method of computation on which most of their statistics are based is utterly fallacious. The much-quoted estimate of Balfour (1926) from the Mayo Clinic, for example, of 1·6 per cent. is arrived at by comparing the number of cases in which gastro-jejunostomy had been performed for simple lesions (8600) with the number of cases from the same group (139), which returned with an anastomotic ulcer. Some of the fallacies of this method have been indicated by Judd (1921), who suggests that in all probability the percentage is somewhat higher than the 1·3 per cent. which he gives, because in some instances the disturbance from the ulcer may not be sufficient to bring the patient back for treatment. A small ulcer is also very difficult or quite impossible to recognise on external examination, and many cases in which it is stated that nothing more than "adhesions" are found at operation are really examples of anastomotic ulcers. Moreover, with the return of symptoms the patient is likely to seek treatment elsewhere, so that the surgeon sees only a small proportion of his patients who develop the condition. Finally, in most of the surgical statistics cases are included which have been operated on only a year or two before, whereas the onset of anastomotic ulcer may be delayed for many years. If a series of cases of gastro-jejunostomy is followed over a long period, the number of anastomotic ulcers slowly but steadily increases, so that a final estimate of the incidence can only be reached after 15 or 20 years. Hohlbaum of Leipzig (1922), Bastianelli of Rome (1927), and Strauss, Bloch, and Friedman of Chicago (1928) are among the many surgeons in all parts of the world who now perform a more radical operation for duodenal ulcer, as they found an anastomotic ulcer developed after gastro-jejunostomy for this condition in 10, 24, and 25 per cent. of cases respectively. Very high incidence rates are given by Lewisohn (1925), who carried out a most painstaking "follow up." In a series of 68 cases re-examined four to nine years after gastro-jejunostomy 23, or 34 per cent., suffered from anastomotic ulceration, and Lewisohn advances strong reasons for supposing that this is more likely to be a minimal than a maximal figure.

In a consecutive series of 10,300 post-mortem examinations at Leeds there were 131 on whom the operation of gastro-jejunostomy had been performed for non-malignant lesions. In 46 death had occurred within ten days of the operation, and in none of these was there true jejunal or gastro-jejunal ulceration. In 41 cases the operation had been performed ten days to two months before death, and in this group there were two cases of acute jejunal and one of acute gastro-jejunal ulceration. In two cases, neither of which showed secondary ulceration, a period of two to six months had elapsed. Chief interest centres in the fourth group, numbering 42, where at least nine months had intervened. Here, no less than 22, or 52 per cent., were the seat of jejunal or gastro-jejunal ulceration or scarring (Table I.).

TABLE I.—*Analysis of 131 Cases of Gastro-jejunostomy for Simple Lesions of the Stomach and Duodenum coming to Autopsy.*

Group.	Period elapsing since operation.	No. of cases.	No. (and percentage) with jejunal or gastro-jejunal ulcers or scars.
1	0–10 days.	46	0
2	10 days–2 mths.	41	3 (7·3)
3	2–6 mths.	2	0
4	9 mths.–19 yrs.	42	22 (52·0)

A still more startling figure is obtained by further analysis of group 4. In 12 cases the original operation was for gastric ulcer, and in three of these there was recurrent ulcer in the stomach. All the 22 cases of jejunal ulceration or scarring occurred in the 30 cases of duodenal ulcer, an incidence of 73 per cent. Obviously this is no criterion of the frequency with which gastro-jejunostomy for duodenal ulcer is followed by ulcerative lesions of the stoma or jejunum, but it suggests that the true incidence is much higher than the 1 or 2 per cent. claimed by most surgeons.

During a period in which 36 patients with gastric ulcer and 137 with duodenal ulcer were seen at New Lodge Clinic, no less than 43 cases of gastro-jejunal and jejunal ulcer came under observation, the operation in every case having been performed elsewhere (Evans Jones).

It is interesting to observe how the reported incidence of jejunal ulcer has increased in the last few years. Thus Paterson, writing in 1909 (*b*), when he was able to collect 65 published cases, stated that no instance of ulcer following the posterior no-loop operation had been recorded! Two years earlier

* Part II. will appear next week.

W. J. and C. H. Mayo, Murphy, and other leading American surgeons had informed him that they had yet to see a case. Ten years later Garnett Wright collected 142 published cases; in 1925 Judd reported 101 cases from the Mayo Clinic alone, and in 1926 Balfour added 38 more from the same source. It is clear that this cannot be wholly accounted for by the increasing frequency with which gastro-jejunostomy is performed nowadays. Two other important factors are at work: (1) the increasing use of the operation in the treatment of duodenal ulcer and its diminishing use in cases of gastric ulcer; and (2) the passage of time, by which cases of ulcer developing 8, 10, and 15 years after operation are now coming under observation.

Although the large majority of anastomotic ulcers follow a gastro-jejunostomy, they may also develop after every variety of partial gastrectomy. Birgfeld in 1925 collected 67 cases from the German literature, and we have seen reports of 14 cases published since that date in which an anastomotic ulcer followed partial gastrectomy. Among the New Lodge Clinic series there was one case in which an anastomotic ulcer was found four years after removal of the greater part of the stomach for a jejunal and a gastric ulcer, the sequelæ of a gastro-jejunostomy performed four years earlier for a duodenal ulcer, and two others in which one developed after partial gastrectomy for a gastro-jejunal ulcer.

Age-incidence.—Anastomotic ulcers are most common in middle life, the period when gastro-jejunostomy is most frequently performed, the great majority of

FIG. 1.

Jejunal ulcer. The patient, a man of 48, had had posterior gastro-jejunostomy performed four years before admission to hospital. Pain in the umbilical region had been present for six months, and five weeks before admission he had had a severe attack of hæmatemesis and melæna. X ray examination showed that the stomach emptied slowly, chiefly through the pylorus, but there was no holding up in the jejunum. At operation the loop of jejunum containing the ulcer was excised, together with the stoma. There is a chronic, penetrating jejunal ulcer just opposite the stoma. Perforation had been prevented by a pad of fibrosed fat in the floor of the ulcer. (Figs. 1 to 4 are two-thirds natural size.)

the cases occurring between the ages of 30 and 50. In the Leeds autopsy series (22 cases) the youngest was 27 and the oldest 57 when symptoms began, while the ages at death ranged from 28 to 59; the average age at the onset of symptoms in 10 cases of gastro-jejunal ulcer was 41·2 years and in 12 cases of jejunal ulcer 43·2 years. In Wright's (1918–19) collected series the youngest was 2 months and oldest 81.

Sex-incidence.—In view of the intimate relation between duodenal and anastomotic ulcer it is not surprising that the latter should show a striking preponderance in males. In 140 cases of active ulceration collected by Wright 113 were males and 27 females. All of our autopsy series of 22 cases were males. In the Mayo Clinic cases (Judd, 1921) there were 90 males and 11 females, although gastro-

FIG. 2.

Gastro-jejunal ulcer from a male aged 39. Six years before he had had a chronic duodenal ulcer infolded and sutured, followed two years later by posterior gastro-jejunostomy. He remained well for three years, but during the past year he had had attacks of severe epigastric pain after food. Radiographic examination showed an ulcer crater close to the stoma. Partial gastrectomy. The ulcer is situated on the posterior wall of the stomach, its inferior margin abutting on the line of anastomosis.

jejunostomy was performed only three and a half times as often in men as in women. In the New Lodge Clinic series of 43 patients there were 37 men and 6 women. In 92 per cent. of the 67 cases following partial gastrectomy collected by Birgfeld the patients were men.

For some unexplained reason a gastro-jejuno-colic fistula has never been observed in a woman, but out of 31 cases of perforation collected by Massie (1924) as many as seven were females.

Profession.—In the New Lodge Clinic series 9 out of 37 male cases, or 25 per cent., were doctors, compared with 16·5 per cent. of the male duodenal ulcer cases and 7·7 per cent. of the male gastric ulcers. When these figures are compared with the incidence of doctors among the total admissions to the Clinic, excluding ulcers—12·5 per cent.—the proportion of anastomotic ulcers among doctors is remarkably high. This does not seem to be entirely due to the high incidence of duodenal ulcer, but is rather the result of the tendency of doctors to undergo operation without giving medical treatment a fair chance; this is well seen in Forsyth's insurance statistics, which show that the numbers of doctors who undergo medical and surgical treatment respectively is about equal.

Family History.—The tendency of duodenal ulcer to occur in families has been discussed by one of us (A. F. H., 1921) in a previous paper. The frequency of a family history is still more commonly obtained in patients with gastro-jejunal and jejunal ulcers. In 6 out of the New Lodge Clinic series of 43 cases there was a clear history of duodenal ulcer in 2, 2, 3, 3, 3, and 5 near relations respectively (vide Charts I. and II.). In 2 or perhaps 3 of these another member of the family had had a jejunal ulcer as well.

Site.—Peptic ulcer occurring in relation to a gastro-jejunal anastomosis is termed jejunal when it is definitely within the jejunum and separated from the line of anastomosis by a band, however narrow, of more or less healthy mucous membrane. Ulcers which occur in the line of anastomosis or which abut

on it, whether principally gastric or principally jejunal, are termed gastro-jejunal. Ulceration is about equally common in the two sites. In a series of 129 cases collected by Wright (1918–19) 66 were jejunal and 63 gastro-jejunal. Of 22 cases examined in the post-mortem room at Leeds under the most favourable conditions for investigating this point, 12 were jejunal and 10 gastro-jejunal. At operation, unless the affected tissues are excised, it may be impossible to say definitely which type of lesion is present.

Conventionally we shall use "anastomotic" as the inclusive term, as both gastro-jejunal and jejunal ulcers are sequels of an anastomotic operation, "gastro-jejunal" and "jejunal" being used solely in the restricted sense.

True jejunal ulcer occurs most frequently in the efferent limb of the jejunal loop (Fig. 1), occasionally directly opposite the stoma, and only very rarely in the afferent limb where the alkaline juices from the duodenum are able to exert an inhibitory influence. Most true jejunal ulcers occur within an inch of the anastomosis, rarely at a distance of several inches.

Gastro-jejunal ulcer, while always implicating the actual stoma, is usually situated mainly on one or other side of it, often stopping short precisely at the line of anastomosis (Figs. 2 and 3). In contradistinction to this is the strict limitation of immediately post-operative sloughing and ulceration to the actual anastomotic line. The latter is probably an invariable occurrence during the first week or ten days after gastro-jejunostomy, in cases where, owing to interference with the mucosal circulation, healing by first intention fails to take place. Even under these circumstances healing is only slightly delayed (Flint, 1917), and there is no evidence to suggest that the sloughing process is followed by true gastro-jejunal ulceration.

Number.—Both jejunal and gastro-jejunal ulcers are usually single. In Wright's collected series of 142 cases all but 9, and in our series of 25 autopsy cases all but 3 had single ulcers. In Leveuf's (1927) collected series of 34 cases of perforated ulcer 26 (8 gastro-jejunal and 18 jejunal) were single and 8 multiple; 5 of the latter group were gastro-jejunal and 3 jejunal, the ulcers numbering 4 in one case and 2 in all the others. In the Leeds series the numbers present in the 3 multiple cases were 2, 3, and 4 respectively.

As in the stomach multiple ulcers are nearly always acute, although occasionally one of them is chronic. Solitary acute ulcer, on the other hand, appears to be relatively more common in the jejunum than in either stomach or duodenum.

Morbid Anatomy.—Jejunal ulcers resemble in all essential respects the more usually situated lesions. They may be acute, subacute or chronic, according to the length of time they have been in existence, and their naked-eye and microscopic characters correspond, *mutatis mutandis*, with ulcers of the stomach and duodenum. They differ from the latter, however, in the important respect that a larger proportion, especially of true jejunal ulcers, give rise to serious trouble while still in the acute or subacute stage. In the jejunum they are usually round or oval (Fig. 1), but large, acute ulcers opposite the stoma are sometimes triangular or polygonal. Gastro-jejunal ulcers, as already mentioned, are often bounded above or below as the case may be, by the anastomotic suture-line, which causes them to assume a rather irregular shape (Figs. 2 and 3). In Judd's (1921) series there were 30 large and 42 small ulcers, 6 being hard and 10 calloused.

In their natural history also they follow gastric precedent. They may heal, perforate, or erode blood-vessels, and they often become adherent to surrounding structures. Extensive and dense adhesions may occur in either variety, but are much more constant in cases of gastro-jejunal ulcer. In Judd's series of 101 cases adhesions of variable degree were present in 54. True jejunal ulcers resemble in many respects ulcers of the anterior duodenal wall. In each case they are situated in a thin-walled, practically unsupported viscus, which accounts for the frequency of perforation and for the infrequency of very large or very chronic lesions. It follows from this that they rarely lead to cicatricial stenosis. Gastro-jejunal ulcers, on the other hand, tend to chronicity and are a frequent cause of mechanical obstruction.

In the healing of the operative (gastro-jejunal) anastomosis, there occurs a definite hypertrophy of the muscularis mucosæ just beneath the line of apposition of the two mucous membranes. A considerable nodule of unstriped muscle may be formed in this way, possibly with the aid of some fibres from the underlying muscularis, and the condition is comparable with what sometimes occurs in the healing of gastric ulcer. If it has not been encroached on by fresh ulceration, it serves as an additional guide to the exact line of junction of the two organs, and in some cases may even help to determine the exact relationship of an ulcer to the stoma.

Unabsorbable materials, silk and linen thread, not infrequently cut out into the lumen of the gut, and in so doing may become associated with local inflammatory and ulcerative disturbances. In other cases, especially when used for the muscular and serosal coats, sutures remain buried in the tissues for an indefinite number of years. Many surgeons hold that they are an important factor in the ætiology of gastro-jejunal ulceration and have given up using them except for the outer suture; others use catgut throughout. It is certainly true that we have not infrequently come across cases in which portions of silk or linen thread were found hanging into the gut from the anastomotic site, but as a rule this has been unaccompanied by true jejunal or gastro-jejunal ulceration. The tendency on the whole has been to stress unduly the importance of this factor. Judd found non-absorbable sutures still present in the ulcer in 9 out of 55 cases (16·25 per cent.) which had originally been operated upon in the Mayo Clinic, but in 17 out of 46 cases (37·77 per cent.) where gastro-jejunostomy had been done elsewhere. On the other hand, a case of Sistrunk's is quoted in which, without any ulcer, heavy black silk sutures were found hanging from the stoma after 12 years. Moynihan (1925) also mentions having seen two cases of this kind. Walton (1925) found a portion of suture in the base of the ulcer in no fewer than 9 of his 20 cases.

There is little evidence to show that the use of catgut only has had any appreciable effect in lowering the incidence of secondary ulcer. Lewisohn (1925) believes that the kind of material used is of little moment. In 21 cases which he reported in 1921 no remnant of suture material was found, although in most of them Pagenstecher's linen thread had been used for the outer layer. Catgut itself is not always rapidly absorbed and may remain embedded in the tissues for many months, often giving rise to a mild grade of inflammatory reaction in its immediate neighbourhood.

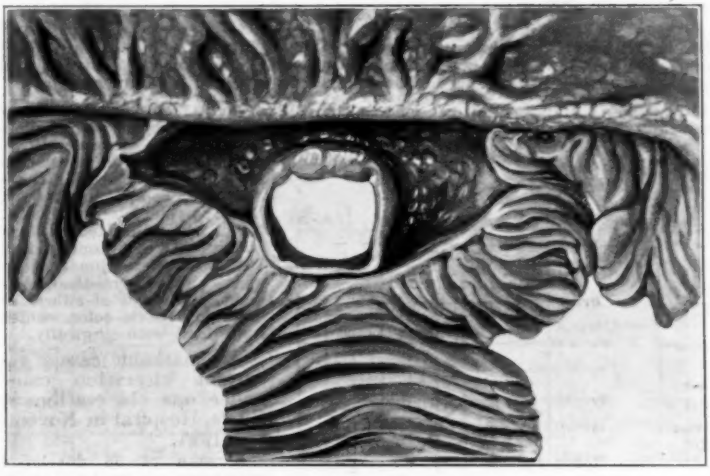
Healing.—It is clear from post-mortem observations that the spontaneous healing of jejunal ulcer, at least of the chronic variety, is a comparatively rare event, much more so than the healing of chronic gastric or duodenal ulcer. In our series of 22 post-mortem cases two only, one jejunal and one gastro-jejunal, had healed without either further operative interference or the development of a jejuno-colic fistula. On the other hand, out of the 35 cases in the New Lodge Clinic series, 25 of which were treated medically, 13 recovered more or less completely without operation. Healing is sometimes greatly facilitated by the performance of a second gastro-jejunostomy, but this operation is so often followed by fresh ulceration in relation to the new stoma, when the last state may be worse than the first, that it is doubtful whether it ought ever to be performed. In cases of jejuno-colic fistula also there is usually rapid healing of the open ulcer, a fact which again emphasises the importance of peptic digestion as a factor in the continuance of the ulcerative process, as the free acid still present in the stomach before the fistula develops is likely to be more or less completely neutralised by the regurgitation of the contents of the colon. In the Leeds series

of five cases of jejuno-colic fistula which came to autopsy without a secondary operation three were completely healed and two were still the seat of open ulceration (Fig. 3).

There is much evidence to support the view that many cases of jejuno-colic fistula are due to the adhesion and perforation of *acute* jejunal ulcers. This may partly explain the readiness with which healing of the ulcer takes place once continuity between jejunum and transverse colon has been established. The mere presence of a jejuno-colic fistula in an old gastro-jejunostomy case, whether active ulceration can be detected or not, is, of course, sufficient proof that jejunal ulceration has existed. A fistula from an acute ulcer which has healed will show no obvious scarring to the naked eye. As in the stomach the scars of chronic ulcers are usually easily detected (Fig. 4.)

For reasons already stated the healing of a true jejunal ulcer is little likely to be accompanied by cicatricial stenosis unless it is of unusually large size and great chronicity. If, however, a chronic ulcer is situated directly opposite the stoma it may, by contraction of its base, produce a spur-like projection in the jejunal loop capable of giving rise to obstruction (Moynihan, 1912). Such an obstruction or one arising within the efferent limb may lead to hypertrophy and dilatation of the afferent limb. Gastro-jejunal ulcers, on the other hand, by virtue of their position as well as their frequent chronicity, are very liable indeed to produce narrowing of the stoma (Fig. 4). Under favourable circumstances, such as the making of a second anastomosis or the spontaneous reopening of a partially stenosed or reflexly narrowed pyloric canal, the cicatrisation and narrowing may be extreme and even lead to complete closure. Stenosis of greater or less severity may result from ulcers which are still active in consequence of the contraction of the fibrous tissue in their floor. Gastro-jejunal ulcer thus falls into line with those ulcers of the stomach and duodenum which lead to cicatricial deformity, and which may or may not be completely healed at the time of operation or autopsy.

FIG. 3.



Gastro-jejunal ulcer with jejuno-colic fistula from a man of 48. In 1923 posterior gastro-jejunostomy was performed for chronic duodenal ulcer with symptoms of long standing. He remained well until April, 1927, when persistent diarrhœa commenced, the bowels moving as often as 15 times a day. He had not vomited, and the appetite remained good, but there was a loss of 2 stones in weight. On one occasion only there was a remission of the diarrhœa for about a fortnight. He was admitted to hospital in December, 1927, with general peritonitis, apparently due to leakage through the floor of the ulcer. The stomach and jejunum as well as the gastro-jejunostomy have been laid open and the specimen is viewed from behind. The line of anastomosis runs almost transversely across the upper third of the picture. Abutting on it from below is a very large, roughly triangular, chronic gastro-jejunal ulcer, with a wide fistulous opening into the transverse colon near the centre. A regular cuff of colonic mucosa, surrounding the aperture, projects into the jejunum.

It was formerly believed that if, as a result of this short-circuiting operation, the patency of the pylorus and duodenum should become restored, and the stomach contents resume their normal route, the gastro-jejunal stoma might undergo a narrowing process from simple disuse. It cannot be too strongly emphasised that jejunal and gastro-jejunal stenosis is invariably the product of peptic ulceration.

Recurrent Ulceration.—It is obvious from what has already been said that the treatment of a case of jejunal ulcer by further operative measures of a conservative kind is likely to be followed by further ulceration. If a jejunal ulcer is treated by simple excision a fresh jejunal ulcer may develop at a later date at the same or some other point. If in addition the gastro-jejunal stoma is closed, fresh gastric or duodenal ulceration may result. Many cases of both kinds are now on record. One or other form of recurrence occurred in 6 out of 22 in the Leeds post-mortem series (27 per cent.) and in 9 out of 44 cases in the New Lodge clinical series (20 per cent.).

FIG. 4.

Gastro-jejunal scar, with extreme stenosis of stoma (shown below). Near the centre of the irregular area of scarring there is a small circular area of re-ulceration. Male, aged 49. First posterior gastro-jejunostomy in 1907, second in 1917. Death occurred in 1925 and was due to the perforation of a second jejunal ulcer in relation to the second gastro-jejunostomy.

(1) *Recurrent Jejunal Ulcer.*—In the Leeds series a recurrent jejunal ulcer developed in three after a second gastro-jejunostomy, and in one after excision of the first ulcer. The interval between the first and second operation was 9, 13, 7, and 10 years respectively, the interval between the second operation and death being 9 years, 8 months, 4 years, and 8 years.

One of these cases (Thompson and Stewart, 1927–28) is of special interest on account of the repeated peptic ulceration from which this patient suffered. Originally the subject of chronic duodenal ulcer of many years' standing, he submitted himself in the course of 16 years to no fewer than five distinct operations, two posterior and two anterior gastro-jejunostomies, and a partial gastrectomy. The original duodenal ulceration and subsequent jejunal ulceration in relation to the two posterior gastro-jejunal stomata cicatrised completely in turn, while a third jejunal ulcer in relation to the third stoma was present at the time of the partial gastrectomy. The patient survived the last operation two years and one month, when he died of chronic nephritis and arteriosclerosis. At autopsy two subacute ulcers were found in the small remaining portion of the stomach.

The following eight cases of recurrent gastro-jejunal or jejunal ulcer occurred in the New Lodge series of 44 anastomotic ulcers.

CASE 1.—M. 1900: aged 16, symptoms began. 1915: gastro-jejunostomy performed two days after an attack of melæna. 1917: entero-anastomosis between the jejunal loops on account of recurring attacks of melæna: a gastro-jejunal ulcer was found. 1920: laparotomy for recurrent hæmorrhage, but nothing found. 1922 and 1926: New Lodge Clinic. Recurrent hæmorrhage continued, but would not consent to further operation. December, 1927: very well since June, 1926, except for three small hæmorrhages in spring of 1927.

CASE 2.—M. 1906: aged 24, symptoms began; no hæmorrhage. 1911: gastro-jejunostomy. Pain worse.

1912: appendicectomy and "repair of gastro-jejunal stoma." Pain worse; hæmatemesis and melæna. 1913: gastro-jejunal ulcer excised, gastro-jejunostomy closed and a new one made on advice of A. F. H. 1922: New Lodge Clinic; no return of ulcer symptoms, but fæcolith in colon. December, 1927: no return of ulceration. Recurrent formation of fæcoliths.

CASE 3.—M. 1914: aged 31, symptoms began; no hæmorrhage. 1915: gastro-jejunostomy for duodenal ulcer. 1917: symptoms returned with hæmatemesis. 1919: partial duodenectomy and almost complete gastrectomy for jejunal and gastric ulcers; the original duodenal ulcer had healed. Relief three and a half years. 1923: New Lodge Clinic; pain and melæna from jejunal ulcer.

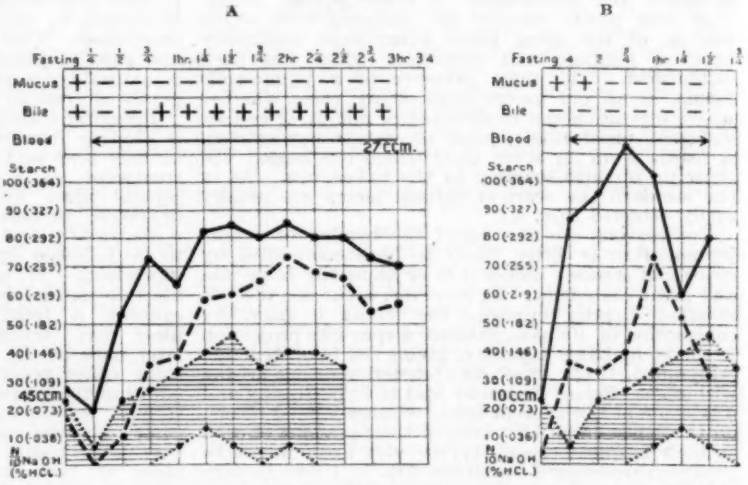
CASE 4.—M. 1915: aged 26, symptoms began. 1916: gastro-jejunostomy; pain returned in 1917. 1924: excision of callous gastro-jejunal ulcer, and new gastro-jejunostomy made. Relief one and a half years. Pain and hæmorrhage then recurred. December, 1926: New Lodge Clinic; a jejunal ulcer, which had almost perforated into the transverse colon, was excised and normal anatomy restored. December, 1927: very well.

CASE 5.—M. 1918: aged 23, symptoms began; no hæmorrhage. 1919: gastro-jejunostomy. Excision of gastro-jejunal ulcer. Relief one year. 1921: pain returned with melæna. March, 1926: having developed another gastro-jejunal ulcer, which had nearly perforated the transverse colon, this was excised and the parts returned to their normal relationship at the Clinic. He remained perfectly well until December, 1927, when a duodenal ulcer developed as a result of a dietetic indiscretion. He soon recovered with medical treatment. (Chart I.)

CASE 6.—M. 1909: aged 23, symptoms began; no hæmorrhage. 1915: gastro-jejunostomy for "pyloric ulcer"; appendicectomy. 1924: recurrence of symptoms with hæmatemesis; partial gastrectomy. 1925: recurrence of symptoms with hæmatemesis. 1928: New Lodge Clinic; gastro-jejunal ulcer. Apparent recovery with medical treatment.

CASE 7.—M. 1915: aged 29; gastro-jejunostomy for "pyloric ulcer" and appendicostomy without previous medical treatment; a four years' history of intermittent dyspepsia. 1924: partial gastrectomy on account of hæmatemesis after nine years of freedom from symptoms. Hæmatemesis recurred in 1925, 1926, and 1927. 1928: New Lodge Clinic with typical symptoms of gastro-jejunal ulcer, which disappeared with medical treatment.

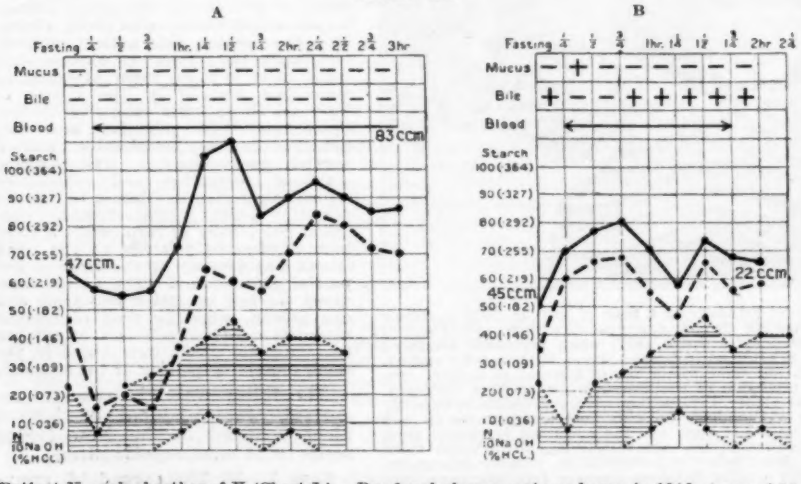
CHART I.



Patient X, male, brother of Y (Chart II.). Duodenal ulcer symptoms began in 1918 at age of 23. Gastro-jejunostomy 1919. Pain returned in six months; several hæmorrhages. 1921: jejunal ulcer excised, stoma closed, new gastro-jejunostomy made. 1922: severe recurrence. Ulcer excised and stoma closed at New Lodge Clinic, April 23rd, 1926. Recurrence duodenal ulcer December, 1927. Curve (A) shows hyperchlorhydria, hypersecretion, and delayed evacuation with jejunal ulcer; curve (B) shows more marked hyperchlorhydria with normal evacuation after gastro-jejunostomy undone. Except in Charts IV. and V., continuous line is total acidity and dotted line free HCl.

CASE 8.—F. April, 1912: aged 21, gastro-jejunostomy three weeks after hæmatemesis, said to have been from a gastric ulcer. August, 1912: partial gastrectomy as constant pain since April. October, 1912: appendicectomy. 1914: hysterectomy. 1928: New Lodge Clinic for constant abdominal symptoms since 1912. Gastro-jejunal ulcer, which yielded to medical treatment, and band of adhesions involving pelvic colon, which were dealt with surgically.

CHART II.



Patient Y, male, brother of X (Chart I.). Duodenal ulcer symptoms began in 1912 at age of 15. Being associated with chronic duodenal ileus causing gastric stasis, duodeno-jejunostomy and gastro-jejunostomy performed at New Lodge Clinic on June 30th, 1927. No return of symptoms (March 1st, 1928). Curve (A) shows hyperchlorhydria, hypersecretion, and delayed evacuation before operation. Curve (B), three months after operation, shows normal evacuation and more marked hyperchlorhydria in spite of presence of bile in most fractions.

A remarkable case of recurrent ulceration came under our observation at Guy's Hospital in November, 1927.

A man of 58 developed symptoms of duodenal ulcer in 1906 and a gastro-jejunostomy was performed for it in 1909. He remained perfectly well till 1923, when pain returned, exactly similar to that which he had had at first. In 1924 he was operated upon for perforation of a duodenal ulcer; this was sutured. The pain returned directly after his discharge from hospital and in 1926 perforation occurred again, but this time it was a jejunal ulcer. The perforation was sutured, and the pain returned at once and continued until his admission to Guy's. The pain was now characteristic of duodenal and not jejunal ulcer, with rigidity and tenderness over the duodenum, the bulb of which was seen with the X rays to be deformed; there was also tenderness over the stoma, so presumably he had both a duodenal and a gastro-jejunal

ulcer. A test-meal showed hyperchlorhydria, hypersecretion, and delayed evacuation, 45 c.cm. of starch-containing material with 0·182 per cent. free HCl being removed at the end of three hours. The pain and occult blood in the stools disappeared with medical treatment, and three months later he was still quite well.

(2) *Recurrent Ulceration in Duodenum of Stomach.* — In the Leeds post-mortem series a fresh ulcer appeared in the duodenum in one case and close to the cardiac orifice of the stomach in another, after a gastro-jejunostomy had been undone on account of jejunal ulcer. In two cases of the New Lodge Clinic series in which a gastro-jejunal ulcer was excised and the parts restored to their normal anatomy, a new duodenal ulcer developed as a result of a dietetic indiscretion; in one of them an earlier jejunal ulcer had previously been excised (Case 5 above). In both cases the duodenal ulcer healed with medical treatment. In another case a gastro-duodenostomy was performed at the same time as the gastro-jejunostomy was undone after excising a gastro-jejunal ulcer; a gastric ulcer developed soon afterwards and death eventually occurred as a result of its perforation.

CHART III.

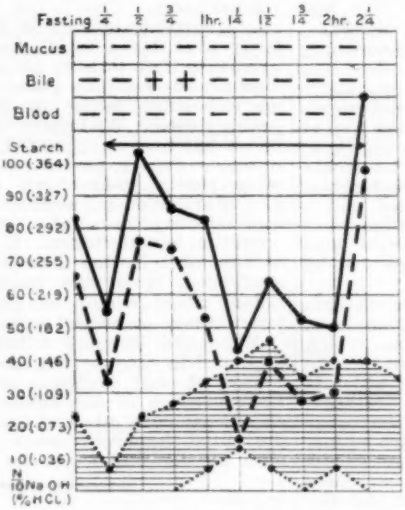


CHART IV.

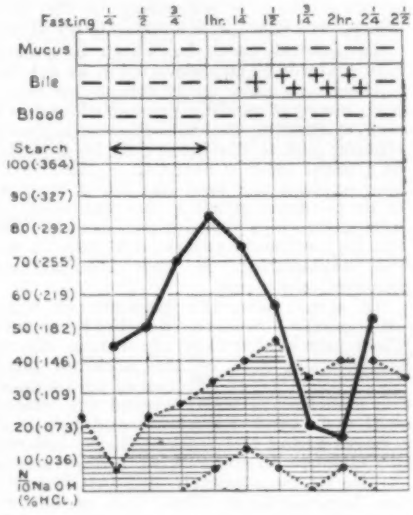
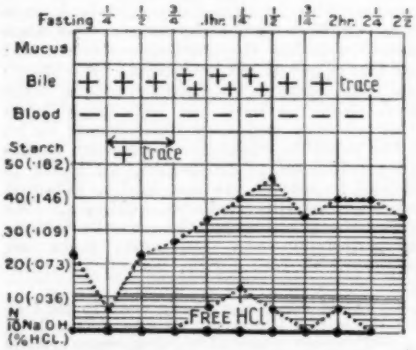


CHART III.—Male. Duodenal ulcer symptoms began at age of 18 in 1903; gastro-jejunostomy 1923; pain recurred 1924; hæmorrhage from gastro-jejunal ulcer 1925. Test-meal (1925) showed hyperchlorhydria and hypersecretion with 75 c.cm. of very acid resting juice, rather slow evacuation, and a little bile in two fractions only.

CHART IV.—Curve of free HCl nine years after gastro-jejunostomy for duodenal ulcer. No symptoms, but hyperchlorhydria persists and entry of duodenal contents is deficient (J. J. Conybeare).

Pathogenesis.—The factors concerned in the production of gastro-jejunal and jejunal ulcers are the same as those upon which the development of primary gastric and duodenal ulcers depend. The presence of free hydrochloric acid and infection are the essential factors. In a few cases an area of diminished resistance is present owing to hæmorrhage caused by puncture of a vessel or bruising from the use of a clamp, or to the delay in healing which may result from the use of unabsorbable sutures. Excessive smoking, mental and physical fatigue, dietetic errors, incidental infections such as tonsillitis and influenza, and conditions which give rise to vasomotor disturbances, such as exposure to rapid changes in temperature, are accessory factors as in simple gastric and duodenal ulcer. These accessory factors may be partly responsible for the high incidence of anastomotic ulcers amongst doctors.

CHART V.



Fractional test-meal nine years after gastro-jejunostomy for ulcer on lesser curvature. No symptoms except distension after meals. Complete achlorhydria and very rapid evacuation. X rays shows that all food passes out of stoma and none through pylorus (J. J. Conybeare).

(*a*) *The Acid Factor.*—Simple ulcers only occur under natural conditions in the stomach and first part of the duodenum because free hydrochloric acid is never present anywhere else, but after the performance of a gastro-jejunostomy the first few inches of the efferent limb of the jejunum may also come in contact with the acid secretion of the stomach. The importance of the acid factor is shown by the fact that free hydrochloric acid is probably always present in the gastric contents of patients with gastro-jejunal and jejunal ulcers (Charts I., II., III., and VI.), and in most cases there is actually hyperchlorhydria and hypersecretion. The frequency of their development varies according to the condition for which the gastro-jejunostomy was performed. Thus they very rarely occur after gastro-jejunostomy for malignant disease, although the poor general condition of the patient might be expected to predispose to the formation of an ulcer. This immunity is probably due to the complete absence of free hydrochloric acid in 65 per cent. of cases of carcinoma of the stomach, and the hypochlorhydria in the majority of the remaining 40 per cent., so that free acid could very rarely be present after gastro-jejunostomy.

Conybeare has shown by fractional test-meals that the curve obtained in cases in which the operation had been performed for duodenal ulcer (Chart IV.) is similar to, though slightly lower than, that characteristic of duodenal ulcer before operation. On the other hand, in cases of gastric ulcer hypochlorhydria and often complete achlorhydria are present after operation (Chart V.). The results are the same whether any symptoms are present or not after the gastro-jejunostomy. They indicate that the addition of the alkaline bile, pancreatic juice, and duodenal secretion, which enter the stomach by the afferent limb of the jejunum, is insufficient to overcome the hyperchlorhydria which occurs in patients who are liable to duodenal ulcer; for this is independent of the actual presence of an ulcer, and is therefore as well marked after an ulcer has healed as a result of medical or surgical treatment as before. But the addition of these alkaline fluids is sufficient to neutralise more

or less completely the less acid gastric juice of the majority of patients who develop gastric ulcer. Corresponding with this, gastro-jejunal ulcers are very much more common after a gastro-jejunostomy performed for a duodenal ulcer than after one performed for a gastric ulcer, even when the latter has led to pyloric obstruction and hypersecretion, as the hypersecretion is secondary to the obstruction and disappears when it is overcome by short-circuiting.

In several cases in which a gastro-jejunostomy was undone at the same time as a jejunal ulcer was excised, we have been struck by the exceptionally high curve of acidity present after the second operation, indicating that an extreme degree of the hypersthenic gastric diathesis may be a predisposing cause of jejunal ulcer (Charts I. (A) and (B)). This would also explain the tendency for a second anastomotic ulcer to develop after one has been excised and a new gastro-jejunostomy performed. The influence of the hypersthenic gastric diathesis is no doubt also the explanation of the familial occurrence of anastomotic ulcers.

In some cases the presence of hyperchlorhydria after gastro-jejunostomy is due to errors in technique. Thus any obstruction at or near the stoma, which hinders the flow of the alkaline fluids from the duodenum into the stomach, or an opening which is too small or is badly placed for effective drainage, so that delayed evacuation and hypersecretion occur (Charts I. and II.) is likely to be followed by jejunal ulceration. In some of our cases there was an excess of bile in the stomach, but insufficient to overcome the hyperacidity. This was probably due to the exit of chyme into or along the jejunum being obstructed, so that it accumulated in the stomach and was only incompletely neutralised by the alkaline juices coming from the duodenum.

The experiments of Mann and Williamson (1923) on dogs confirm these views as to the pathogenesis of jejunal ulcers. They divided the pylorus and first part of the jejunum. After closing the distal end of the divided pylorus they anastomosed the proximal end with the distal end of the jejunum and the proximal end of the jejunum with the ileum, so that all the alkaline bile, pancreatic juice, and duodenal secretion flowed into the ileum, whilst the acid gastric contents entered the jejunum. A typical chronic ulcer almost invariably developed in the jejunum, and many of the ulcers perforated. They promptly healed if the normal gastro-intestinal tract was re-established.

The presence of free hydrochloric acid is not by itself capable of giving rise to a gastro-jejunal or jejunal ulcer, as free acid is almost invariably found after gastro-jejunostomy performed for duodenal ulcer, even when the result is entirely satisfactory (Chart V.). Some other factor must therefore always be present. The exciting cause of the ulcer is probably the same in most cases as that of the original gastric or duodenal ulcer for which the operation was performed. It is not surprising that a secondary ulcer should occur when free hydrochloric acid is still present if this cause has not been removed.

(*b*) *The Infective Factor.*—The most important exciting cause of gastro-jejunal and jejunal ulcer is the presence of infective foci in connexion with the teeth, pharynx, nasal sinuses, appendix, or gall-bladder. Complete dental reports are still available in 36 of the New Lodge Clinic series; more or less widespread pyorrhœa alveolaris was present alone in 20, apical dental infection alone in 2, and both together in 6; 6 were edentulous, and only two had normal teeth. In four cases a diseased appendix was removed after the development of the anastomotic ulcer, but without causing it to heal, as the ulcer was still active when the patient was subsequently admitted into the clinic.

Gordon Taylor observed a case in which a jejunal ulcer perforated as a direct sequel of an attack of acute appendicitis. It is also possible that infection may occur from a chronic gastric or duodenal ulcer which has not healed. Bohmansson (1926) has recently drawn attention to the possible influence of gastritis in the development of gastro-jejunal ulcers, as the investigations of Konjetzny and others have shown how frequently gastritis is associated with gastric and duodenal ulcer. An anastomosis made between the inflamed mucous membrane of the stomach and the healthy mucous membrane of the jejunum is likely to heal incompletely and form the basis of a gastro-jejunal ulcer. This is one reason why many continental surgeons now prefer to perform partial gastrectomy even for a small duodenal ulcer, as by this operation they remove all or the greater part of the area involved in the gastritis, which they regard as an important factor in the pathogenesis of the primary ulcer. We believe that the importance of this factor has been exaggerated, but the almost constant presence of active gastritis in fresh specimens obtained when partial gastrectomy is performed for simple gastric and duodenal ulcer shows the necessity of giving a preliminary course of medical treatment before any operation is undertaken. If at the same time all foci of infection in the mouth and naso-pharynx are eradicated, it is very improbable that any active inflammation would be present when the gastro-jejunostomy or partial gastrectomy is performed.

Mann and Rosenow found that the jejunal ulcers produced in dogs by the operation already described always showed evidence of streptococcal infection. Immunisation of one animal with streptococci from an experimental ulcer of this kind in another animal prevented the development of an ulcer in the former after the performance of the operation.

SPLENOMEDULLARY LEUKÆMIA IN AN X RAY WORKER.

WITH A DISCUSSION OF PREVIOUSLY REPORTED CASES.*

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WE have recently had the opportunity of observing a lay X ray worker who developed myeloid leukæmia after ten years' continuous employment. We were specifically asked whether the patient's work could be regarded as the cause of his leukæmia. We therefore examined the scanty published records with some care and, since no case has previously been reported in this country and very little seems to be known about the possible relationship between radiations and the production of leukæmia, we think it may be of interest to record our case and to attempt a critical discussion of the available evidence. We find that much of the evidence for the causal relationship between radiations and leukæmia rests on such an unsubstantial foundation as to be quite unconvincing.

Case Report.—The patient began X ray work in 1914 at the age of 33. He joined the Army on the outbreak of war and, after a preliminary course of training, began regular work as an X ray assistant in a military hospital in the south of England. In 1916 he was sent to another military hospital to start an X ray department, and remained there two years. In 1918 he was sent to a special orthopædic hospital in the north of England. Here he was in charge of the whole apparatus, and carried out all the routine X ray examinations until March, 1925, when the hospital closed down. He was thus actively engaged in X ray work for about ten years, and the first symptoms began a few months before the end of that time. We have no details of the degree of protection afforded by the apparatus he used. He stated that the ventilation during the last seven years was poor.

He first complained of exhaustion, substernal pain, and breathlessness on exertion towards the end of 1924, and

* Based on a paper read before the Liverpool Medical Institution on Nov. 17th, 1927.

these symptoms, with loss of weight and energy, continued during 1925. In August of that year splenic enlargement was noticed, and in December, 1925, he was sent to see Dr. A. D. Bigland at the Royal Infirmary, Liverpool. A blood count made by one of us at that time showed 256,000 white cells with the typical picture of myeloid leukæmia. The spleen reached the level of the umbilicus. In the early part of 1926 he was treated with benzol with no improvement, but in July, 1926, started X ray treatment at the Royal Infirmary, Liverpool, with marked temporary benefit. The spleen shrank rapidly until it was only just palpable, and the white count in November, 1926, was 14,000. During the early part of 1927, however, the condition relapsed, and further X ray treatment proved ineffectual. He died on Jan. 4th, 1928, the last observations in November, 1927, showing a myeloblastic termination. No autopsy was permitted. (See table.)

34, he had an abrupt hæmatemesis. Marked deterioration in health appeared in May, 1924. Splenomegaly was noticed in June, 1924, when the blood showed 146,000 white cells with the typical picture of myeloid leukæmia. Temporary improvement followed a course of X ray treatment, but later a rapid decline ended in his death in January, 1925.

At autopsy, the spleen weighed 2·45 kilos. The spleen and marrow showed myeloid metaplasia; the testicle was atrophied. The authors were unable to demonstrate radioactive substances in the organs by photographic methods.

The second man in July, 1924, when aged 40 was taken ill with anæmia, weakness, and digestive disturbances, the blood examination indicating aplastic anæmia. He also died in January, 1925, autopsy showing a fibrotic marrow. No mention is made of the testis. This is a unique observation of two patients, exposed to radium and later to thorium

DETAILS OF THE BLOOD EXAMINATIONS.

X ray worker. Splenomedullary leukæmia.

—	Dec., 1925.	July, 1926.	Nov., 1926.	March, 1927.	August, 1927.	Nov., 1927.
Hæmoglobin percentage ..	90	40	92	74	62	50
Red cells ..	5,150,000	2,700,000	5,300,000	3,775,000	3,850,000	3,375,000
White cells ..	256,000	460,000	14,062	36,875	80,625	355,000
Platelets	585,000	—	430,000	269,000	163,000	95,000
Films	Typical. Myelocytes approx. 20 per cent.	—	Myelocytes approx. 5 per cent.	Myelocytes 20 per cent.	Myelocytes 25 per cent. Myeloblasts numerous.	Myeloblasts largely increased.
Spleen	At umbilicus.	3 fingers-breadth below umbilicus.	Just palpable.	3 fingers-breadth below costal margin.	5 fingers-breadth below costal margin.	4 fingers-breadth below umbilicus.

X ray treatment started 13/7/26.

Other Case Reports.

CASES 1–4.—Von Jagie, Schwartz, and Siebenrock, Vienna, 1911,[13] reported four cases of lymphatic leukæmia. The complete report is in the following terms: "Some years ago a radiologist practising in Vienna died from this disease (lymphatic leukæmia), and the story goes that a radiologist of Munich died similarly. One of us (Schwartz) had the opportunity of examining the blood of a chemist who had worked for a long time in a radium factory. We have also information that a radiologist in America recently died from the condition."

It is clear that the second case mentioned cannot be seriously entertained, and Carman and Miller (1924) were unable to trace the American radiologist. This report becomes reduced, therefore, to two possible cases, and even in these no details are given.

CASE 5.—Aubertin,[3] France, 1911 (quoted by Jaulin, 1927,[14] also Emile-Weil, 1925 [9]). The latter says: "M. Aubertin has written, without details, that he knew of a case of myeloid leukæmia observed by Prof. Vaquez—namely, the radiologist K. . . ." We have failed after a long search to find Aubertin's original statement, but it will be seen that Emile-Weil specifically states that no details were given.

CASE 6.—Carman and Miller,[6] Mayo Clinic, 1924, reported the case of Dr. Mills, aged 46, who had been in busy practice as a radiologist for 14 years. The authors state that "he was not punctilious as to protection and sometimes omitted to wear an apron." In the latter part of 1923 he complained of extreme exhaustion at the end of the day's work, and in January, 1924, a blood count showed a marked lymphocytosis. He went to the Mayo Clinic in the same month and was found to have enlarged cervical and inguinal glands. The blood showed hæmoglobin 65–70 per cent., red cells 4½ millions, white cells 30,000, with 96 per cent. of lymphocytes. Shortly after entering the clinic he was striken with acute appendicitis for which operation became imperative, and he died three days after the operation.

CASE 7.—Emile-Weil and Lacassagne,[8] France, 1925, described two cases of exceptional interest. The two patients were research chemists who had worked with radioactive substances before the war. After military service from 1914–16 they were recalled from the front for work in a radium factory, continuing there until the end of 1920. They then undertook research into therapeutic preparations of thorium X, working, as the authors declare, under similar conditions, in a badly ventilated laboratory, and with no protection against the emanations of the substances they handled. From the end of 1923 onwards the first took over the administrative direction of the works and only did actual laboratory work in the absence of his colleague. Both were robust men, and this first one, in whom we are particularly interested, married in 1919 and became a father in 1920. In December, 1923, when he was in almost identical circumstances, one of whom died of aplastic anæmia, the other of myeloid leukæmia.

CASE 8.—Béclère,[3] France (quoted by Emile-Weil, 1925, and Jaulin, 1927). This unpublished case rests on a statement by Emile-Weil. "In connexion with our case (thorium worker, supra) we made inquiries of M. Antoine Béclère, who told us he had knowledge of a case of myeloid leukæmia occurring in a radiologist of Poitiers."

CASE 9.—Merklen, Wolf, and Néel,[17] Strassburg, 1925. The patient was a German woman aged 62. In 1917 a single dose of X rays of seven hours' duration, details unknown, was applied to the abdomen by Kronig at Fribourg for uterine fibroids. In 1921 she had a hæmatemesis. Four years later (January, 1925) she consulted the authors for indefinite digestive trouble and weakness. They found an enlarged spleen, the blood showing 400,000 white cells with 51 per cent. myelocytes and 3 per cent. myeloblasts. The patient died in February, 1925, a count shortly before death showing 960,000 white cells with 16 per cent. myeloblasts.

Assuming that the hæmatemesis marked the beginning of the leukæmic state, the onset occurred four years after the X ray exposure.

CASE 10.—MacCallum,[15] U.S.A. In the third edition of his text-book of pathology MacCallum makes the following statement (p. 390). "I saw one case recently in which the irradiation of a mediastinal lymphosarcoma coincided with the appearance of leukæmic changes in the blood, soon followed by death."

These 11 accounts represent every scrap of evidence we can find which appears in any way to associate radiations with the production of leukæmia. It is clear that we must at once discard Von Jagie's Cases 2 and 4, and the objection may be made to MacCallum's that it may from the first have been leukæmia with a temporary aleukæmic stage, or an example of leucosarcomatosis. In Von Jagie's Case 1 there is no mention of personal knowledge. This leaves seven cases for critical discussion. Of these in No. 3 (Schwartz), No. 5 (Aubertin), and No. 8 (Béclère) no details are given, but as the language used suggests personal knowledge we accept them for discussion, though with reserve. Even in the other four cases, where sufficient detail is at hand to establish the diagnosis, there are no precise observations on the amount of exposure.

Taking, then, the seven cases, the only general facts which are clearly apparent are:—

Four occurred in radiologists, one followed therapeutic use of X rays, and two were in radium and

thorium workers respectively. In only two cases (Carman, Emile-Weil and Lacassagne) is there specific mention of inadequate protection or bad conditions. Five were of myeloid, two of lymphoid type. It follows that any explanation as to the relationship of radiations to leukæmia must be adequate to cover either type. In five cases a statement of time is made, as under:—

Case.			
3 ..	Von Jagie and Schwartz. ..	Radium worker ..	"A long time."
5 ..	Carman and Miller. ..	Radiologist ..	14 years.
7 ..	Emile-Weil and Lacassagne. ..	Radium 4 yrs. / Thorium 4 yrs. ..	Approx. 8 years.
9 ..	Merklen et al ..	Therapeutic use, single X ray exposure. ..	Inception at least 4 yrs. later.
11 ..	Evans and Roberts. ..	Radiologist ..	10 years.

Assuming for the moment a causal relationship between radiations and leukæmia, it appears (*a*) that X rays are more incriminated than radium; (*b*) that considerable length of time is necessary for the condition to develop; (*c*) that the amount of dosage required is small; (*d*) that both lymphoid and myeloid types may occur.

Effects of Radiations on the Circulating Blood and Blood-forming Tissues.

1. *Destructive Effects.*—It is clearly established that radiations can destroy the cells both of the circulating blood and of the parent blood-forming tissues. Adopting the dualist theory of the origin of the blood cells—that the marrow produces red cells and granular white cells, and the lymphoid organs the lymphocytes—we may briefly examine the evidence under three heads—viz., the effects on (*a*) the circulating blood cells, (*b*) the lymphoid tissue, (*c*) the bone-marrow. There seem to be distinct differences, not always clearly recognised, between the effects in man and in experimental animals. In both, however, it is evident that the white cells and their parent tissues suffer before the red cells.

(*a*) *Circulating Blood.*—In animals the invariable result is a destruction of the lymphocytes,[4 19] which was shown by Aubertin and Beaujard, from the number of degenerated cells seen in blood films, to occur in the blood stream. In man, under ordinary professional exposure, the first result is leucopenia with relative lymphocytosis—i.e., it is the granular cells which are first killed off.[3 13 21] Yet this is not absolutely constant. Von Jagie mentions cases in professional workers with absolute as well as relative lymphocytosis; Aubertin cases with neutrophilia and moderate eosinophilia; Pfahler cases with moderate eosinophilia. Minot and Spurling[18] in cancer patients found leucopenia with lymphopenia and relative granulocyte preponderance, and sometimes marked eosinophilia (up to 23 per cent.).

(*b*) *Lymphoid Tissue.*—In animals there is no doubt that not only the circulating lymphocytes but also the lymphatic glands and lymphoid elements of the spleen suffer long before the bone-marrow,[4 11 19 24] and they may be almost totally destroyed before signs of marrow injury appear—indeed, some observers say that the myeloid elements may appear to be stimulated. In man very little seems to be known about injury to the lymphatic tissues; it is not even mentioned in those cases of aplastic anæmia where the bone-marrow has been completely overwhelmed.

(*c*) *Bone-marrow.*—In man the maximal effect of the destructive action of radiations is seen in the condition of aplastic anæmia, a condition in which the red cells and granular white cells suffer pari passu. Of this proved occupational hazard of workers in radio-active substances, Jaulin[14] has collected nine examples, six in radium workers and three in radiologists. Hoffmann[12] mentions three cases occurring in association with necrosis of the jaw in girls engaged in painting luminous watch dials with a paint containing radium and mesothorium. Martland, Conlon, and Knef[16] refer to two more of these girls, and also mention their personal knowledge of two unpublished fatal cases in radiologists. The condition may readily be reproduced in experimental animals with any form of radio-active substance; it is simply a question of sufficient dosage.

These observations have been extracted from a bulky and confused literature with the purpose of showing that while there is positive evidence that radiations exert destructive effects on the blood and blood-forming tissues, yet there are great variations in the susceptibility of the different parts of these tissues, and even among different individuals. This is not surprising in view of the differing conditions under which the observations have been made. As Warren well remarks, "It must be emphasised that great confusion exists in the study of the effects of roentgen radiations on the body tissues because of the lack of suitable standardised measuring devices, the absence of an easily established biological unit of dosage, and the failure of the various investigators to consider the variables introduced by the different wave lengths of radiations with their variation in penetration and absorption." To which we may add that too little attention has been paid to the differences between the effects in man and in experimental animals.

2. *Stimulating Action.*—The case for a stimulating action of radiations on the blood-forming tissues is not by any means so clearly made out. In his Mackenzie-Davidson lecture, 1927, Rolleston[23] balances the evidence for and against a stimulating action, and agrees with Desjardins[7] that evidence in favour is lacking, and that any apparent stimulation is invariably followed by more or less functional or organic deterioration. Martland[16] came to the same conclusion. In a later review Warren[23] sums up the question by saying: "Almost infinitesimal amounts of the very longest wave lengths may be able to stimulate normal cells (lymphocytes) with the production of normal daughter cells. The proof for a general stimulating effect of roentgen radiation is lacking." This statement is based on the work of Murphy, who, using a minute dose of soft rays from a special Coolidge tube, found definite evidence in mice of stimulation of the lymphocytes: an increase in the circulating blood, and notably increased mitoses in the lymph glands and spleen. With slightly larger doses he observed lymphopenia, with increase of polymorphs and apparent stimulation of the bone-marrow. This is the only clear evidence in favour of a stimulating action. It is interesting, however, in view of the smallness of the dose, as presumably under modern conditions the exposure in X ray workers is very small.

3. *Experimental Production of Leukæmia.* — As already pointed out, aplastic anæmia can readily be reproduced in experimental animals. There is no mention in the literature of the reproduction in animals of any disease comparable with leukæmia, not even in Murphy's careful and extensive work. It may be objected that it is uncertain whether leukæmia as it occurs in man is met with in lower animals, though in a recent review of this subject Opie[20] concludes that "leukæmias conforming with the types met with in man occur in many, if not all, domestic animals, and in small animals available for experimental studies." The relation between leukæmia and radiation would, however, be much more definitely established if the condition could be experimentally produced.

Mechanism by which Radiations might bring about Leukæmia.

Von Jagie, in trying to account for cases of lymphatic leukæmia, suggests that the lymphoid hyperplasia is compensatory to the destruction of the granulocytes, "in the Weigert sense"—i.e., of regeneration after loss. Ziegler, one of the early workers, by the application of large doses of X rays to the spleen, was able to produce in animals destruction of the lymphoid follicles with myeloid metaplasia of that organ. At the same time he noted a myelocytic blood reaction, and thought that the damaging

action of the X rays on the lymphoid tissue of the spleen disturbed a hypothetical mutual inhibitory reaction existing between the lymphoid and myeloid systems. There seems, however, little proof that this can be regarded as comparable to human leukæmia; it is, rather, a myeloid reaction, comparable to Murphy's lymphoid reaction.

Farley[10] says:—

"In view of the undoubted production of aplastic pernicious anæmia by the action of X rays on the bone-marrow, it is not surprising that the production of a myelogenous type of leukæmia should be reported, but the production of lymphatic leukæmia by such means should not be credited without very close scrutiny."

Amundsen,[1] referring to the cases of lymphatic leukæmia, says that the lymphocytes in professional workers quickly regenerate, and that no doubt the cases of lymphatic leukæmia occurring in radiologists "may be regarded as a lymphocytic regeneration overshooting the mark."

Emile-Weil and Lacassagne assert positively that their two thorium workers represent the difference between a destructive effect by a large dose and stimulation by a small dose. Yet, since Emile-Weil admits in a later paper that as far as could be reckoned the degree of exposure was equal in the two patients, their cases form a singularly unfortunate basis for such an argument, and could be better explained on the ground of individual differences between the two men. Carman[6a] also is of opinion that destructive and stimulating effects may occur, varying with the amount of the dosage.

All these explanations postulate a persistent stimulation, whether primary or regeneratory. We have already shown that the general evidence in favour of a stimulating effect is lacking at the present moment. Until further more conclusive evidence is at hand we must regard any such explanation as attractive but unproved. At the same time it does not seem possible in the present state of knowledge to advance any other satisfactory working hypothesis.

The other possibility, which seems to have been completely ignored, is that in these cases the leukæmia was a pure coincidence. When we consider the small number of cases reported and the large number of persons either working with, or treated by, radio-active substances, we feel strongly that this is a perfectly reasonable explanation. The clinical characters of either type of leukæmia are so definite that it is difficult to imagine that any large number of cases would long escape recognition.

Conclusions.

After careful examination of the literature we conclude that the case against radiations as a cause of leukæmia is not proven on the following grounds:—

1. The slenderness of the available evidence, both in regard to the small number of cases and the lack of detail in a large proportion of the reports.
2. The lack of experimental proof.
3. The difficulty, in the present state of knowledge, of advancing any satisfactory theory of the way in which radiations may bring about leukæmia.
4. The impossibility of excluding coincidence.

We use the expression "not proven," because we do not feel that the possibility of causal association can be positively denied. It is obviously a matter of some importance both from the point of view of the professional worker and the patient under treatment. We would suggest that the heads of radiological departments should occasionally review their staffs and patients. Clinical examination and a blood smear would give the diagnosis in the great majority of cases if they occurred. We think that an open mind should be kept on the subject, and in the meantime it is clearly of importance that all cases should be reported.

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2. Aubertin, C.: Quoted by Emile-Weil, infra.
3. Same author: Arch. d'électrol. méd., 1912, xx., 150.

(*Continued at foot of next column.*)

Clinical and Laboratory Notes.

AN UNUSUAL ATTITUDE OF THE CHILD IN UTERO.

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THE attitude and presentation in this case appear to be so uncommon that it is worth recording.

The patient was 32 years old and a multipara, with three living children out of five normal labours and one miscarriage. The date of the last menstruation was Feb. 23rd, and labour was due on Nov. 30th, 1927. The patient first came to the antenatal clinic of the Liverpool Maternity Hospital in about the thirtieth week of pregnancy. For some time she had been under treatment for bronchitis. There was severe cough, profuse mucopurulent expectoration, and some dyspnœa, which did not respond well to the usual treatment. Throughout the antenatal period the child changed its position frequently. At the beginning of the thirty-ninth week the position was transverse with the head in the right iliac fossa. The fœtal heart sounds were heard loudly in the midline about 3 inches above the symphysis. External version was tried but it was found impossible to move the head out of the right iliac fossa. On attempting to push the breech up towards the fundus it rotated forwards and could be brought almost over to the right side, but returned to its original position at once.

The case was X rayed by Dr. R. E. Roberts, who sent me two very interesting and beautiful films, which showed the child lying with the head hyperextended in the right iliac fossa and the thorax over the brim of the pelvis with the arms behind the back. The back was extended, and the thighs were extended with the legs flexed at the knees so that the feet were approaching the head. External version was again attempted but without success, the reason being clear from a consideration of the attitude of the child. Pressure on the head in any direction only increased the extension, while the breech could not be manipulated on account of the extended limbs. Combined external and internal manipulation could not be carried out without an anæsthetic, which was contraindicated by the chest condition. Cæsarean section under spinal anæsthesia seemed to hold out the greatest hope for both mother and baby.

Cæsarean section was performed on Dec. 3rd, 1927, the 283rd day of gestation; 1 c.cm. of stovaine was injected into the spinal canal in the second lumbar space, and the patient was quite ready for operation in about ten minutes. Before the operation, and while the abdomen was quite anæsthetic, version was again tried but without success. The operation presented no difficulty and was quickly carried out. A noticeable feature was the almost complete absence of bleeding from the uterine incision. This absence of bleeding

Drs. Howel Evans and R. E. Roberts: References.

(*Continued from previous column.*)

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was also marked in six other cases in which spinal anæsthesia was employed; in a seventh case ½ c.cm. of pituitrin was given on account of fainting due to falling blood pressure, and in this case the bleeding was very free.

On opening the uterus the child was found in the position and attitude shown in the radiograms. Delivery was easy and the placenta was found on the posterior wall, rather lower than usual. Whether this low position of the placenta had been a factor in causing the presentation it is hard to say. It was not abnormal in size or bulk. There were two small white infarcts towards the centre. The child weighed 8 lb. 4 oz. and was fully developed and normal in every respect.

Except for an exacerbation of the chest symptoms for the first 24 hours, the patient made a splendid recovery. Anæsthesia was induced at about 10.30 A.M.; sensation was returning at 11.45 A.M., and had returned fully at noon.

I have looked up most of the standard books on obstetrics and have been unable to find any mention of a similar case. The nearest approach is the transverse presentation in which the back is posterior and the right arm has prolapsed. In this group, however, labour has started, and the driving down of the right shoulder into the pelvis has brought about the extension of the head and spine. In my case the malposition was present and persisted for at least a week before operation. In the majority of transverse presentations before the onset of labour, while the head may be extended the limbs are usually flexed, and so it is comparatively easy to grip either pole of the child and convert the transverse lie into a vertical one.

All the usual causes of transverse presentation were absent in this case, and it is very difficult to formulate any ætiological theory.

A CASE OF ABDOMINAL TUBERCULOSIS WITH EXTREME EMACIATION.

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THIS case is so striking that I have thought it worthy of publication as showing to what degree emaciation may proceed and be compatible with life. The child was a skeleton. Moreover, she was a walking skeleton, and would smile and take an interest in what was going on around her, the characteristic apathy being absent. We are all familiar with cases of extreme emaciation in infancy which have recovered; I attribute this recovery to a combination of remedies.

The child was admitted on May 1st, 1925, when aged 8 years 11 months; her weight was 2 st. 2 lb. 4 oz., and her height 3 ft. 8½ in. The temperature range was from 97° F. in the morning to 102° or 103° in the evening. There was extreme emaciation, anæmia was marked, and the child was critically ill. Treatment by mercury-vapour lamp for two minutes daily was instituted, increasing gradually to five minutes daily. No improvement was noted in the temperature; the child lost weight and the stools became more offensive. The artificial sunlight treatment was stopped in September, when there had been

—	Blood counts.	Weight.	Temp.
November.	R.B.C., 1,687,500 W.B.C., 4,350 Hb., 35 per cent.	Gain 1¼ lb.	99°
January.	R.B.C., 3,465,000 W.B.C., 7,000 Hb., 38 per cent.	,, 7 lb.	99°
March.	R.B.C., 4,387,500 W.B.C., 7,500 Hb., 40 per cent.	,, 13 lb.	99°
June.	R.B.C., 5,582,900 W.B.C., 7,750 Hb., 58 per cent.	,, 21 lb.	Normal.
August.	R.B.C., 5,225,000 W.B.C., 6,500 Hb., 60 per cent.	,, 24¼ lb.	,,

a total loss of 3¼ lb. since admission. In January, 1926, there was a total loss of 4¼ lb. Her condition remained stationary until the spring, when natural sun treatment was commenced; she began to show very slight improvement, and the total loss in weight was reduced to 1¼ lb. At her own request artificial sunlight treatment was restarted in May, 1926. The improvement continued, until in July and August a definite reduction of temperature took place, the range being from 97°–100° with an occasional evening rise to 101°. By the end of October, 1926, she had regained the 4¼ lb. she had lost and the temperature had reached 100° only on two occasions. Intensive treatment by natural sunlight had been possible up till now, owing to the exceptionally fine weather, and the patient was well tanned all over. The anæmia was still marked, the blood count being: 1,687,500 red cells, 4350 white cells, hæmoglobin 35 per cent. Subsequent progress is shown by the table. In November treatment by collosol iodine was instituted in addition to the artificial sun treatment, and the child's progress from this point was remarkable. The temperature never again reached 100°; there was a steady gain in weight, and a progressive lowering of the temperature. Stools became less frequent and the blood counts showed a satisfactory lessening of the anæmia. The temperature gradually

May 1st, 1925. June 11th, 1927.

fell, until by June it was for the most part normal, occasionally rising to 99°. The second photograph was taken at this stage. The stools had become normal and the child was discharged from the sanatorium in August, 1927, with a total gain of 24¼ lb. in weight. Reports from her home show that she has kept well all the winter, and has attended school and is keeping pace with the other scholars.

Improvement was initiated by exposure to natural sunlight and enhanced by artificial sunlight, but with the administration of collosol iodine the recovery was rapid and complete. This was in the winter months, and so one cannot altogether ignore the value of artificial light in replacing the real sun under which return to health undoubtedly began.

HYDATID CYST WITH JAUNDICE.

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CASES of hydatid cyst are comparatively rare in this country, and it seems advisable to place the following on record, particularly in view of the symptoms.

The patient, aged 12, was admitted to Booth Hall Infirmary as a case of jaundice. A year before he had had a similar illness which had lasted a fortnight. The present illness began four weeks before admission with feelings of tiredness and biliousness. The boy had pain in the abdomen and vomited.

On admission he complained of aching pain in the abdomen, and declined food. There was no vomiting, the stools were

clay-coloured, and the urine of a high colour, with bile in abundance. The skin and conjunctivæ showed intense jaundice; the mucous membranes were pale and yellow. On examination the abdomen was generally tender, especially over the liver, which was enlarged almost to the umbilicus. The temperature was 100·4° F., pulse-rate 116, respirations 26. The provisional diagnosis was "obstructive jaundice; acute septic cholangitis." The radiologist reported: "Liver shadow much increased downwards and slightly upwards, the right diaphragm being raised about 1 inch. No pleural effusion. No evidence of gall-stone or abscess (but neither is likely to show)." Stools were examined by cultivation, but no organisms of the enteric or dysentery groups were found. The blood reaction was negative to typhoid and paratyphoid A and B. The Wassermann reaction was negative. The van den Bergh reaction was biphasic.

The progress of the case was steadily downward. The temperature was intermittent, rising as high as 104°, and the pulse-rate ran up to 130 and ultimately to 150. The jaundice became more intense, vomiting developed and became persistent, and the boy died after an illness of almost six weeks.

Post-mortem examination showed numerous small abscesses scattered over the whole of the liver, with one large abscess in the upper part of the right lobe. This had an inner lining which peeled off completely and easily. The spleen had no abscesses. The kidneys were enlarged and fatty, without abscesses. From the abscesses streptococci were grown, and microscopical examination of the wall of the large cavity in the liver showed that it was the laminated ectocyst of a hydatid cyst.

The patient's medical adviser, Dr. J. H. Rowan, ascertained that about three years ago the boy had been in contact with a dog which had had to be destroyed for some unknown disease. It had wasted and had yellow eyes. The boy had never lived abroad. Apparently the course of events was that the boy developed a hydatid cyst in which suppuration took place, leading to generalised streptococcal hepatitis.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

MEDICAL AMBITIONS AND IDEALS.

DR. J. W. CARR'S PRESIDENTIAL ADDRESS (ABRIDGED).

AT the annual general meeting of this Society, held on Oct. 8th, DR. J. WALTER CARR said:—

When in the summer of 1923 I had the privilege of delivering the Annual Oration before the Medical Society of London, I chose for my subject the way in which the medical profession, if only it had a free hand, could prolong the lives and improve the health of the population of this country. I pointed out that by the removal at an early stage of the intestinal cesspool or large bowel, of the tonsils, and later on of the permanent teeth shortly after their eruption, an enormous amount of ill-health and of actual organic disease would necessarily be abolished. In addition, that removal of the breasts and of the uterus, as soon as their functional activity had come to an end, would completely eliminate a large proportion of the deaths from cancer in females. Also, that by a highly organised system of prophylactic vaccination we might hope almost to abolish the great group of infective diseases—viz., the acute specific fevers and the acute infections of the respiratory organs—which are responsible for such a large percentage of the deaths in this country; that by the provision of suitable housing accommodation and of other hygienic improvements for our children and our cows we might anticipate the practical extinction of all forms of tuberculous disease; that by psychotherapy we might expect to prevent, or at least cure in an early stage, the majority of mental disorders; that by the habitual use when necessary of prophylactic measures, venereal diseases might be kept in check; and that, finally, premature degenerative changes would very largely be prevented by appropriate endocrine medication. In fact, men would die only of old age or from road accidents. If it is possible for the medical profession to confer such inestimable benefits upon the civilised world (the uncivilised races, we gather, already enjoy perfect health and only need to be protected from death by violence), it becomes our urgent duty to consider what steps we ought to take to secure for our fellow-creatures blessings so far-reaching.

The Motives of Mankind.

To get the whole subject in the right perspective we have to consider what are the motives which normally dominate able and ambitious men; for, after all, doctors are first and foremost human beings, men of like passions with other men, although as a result of their training and daily work, their ultimate aims doubtless tend to be somewhat more altruistic and less directly selfish than those of the majority of their fellows. I emphasise also that it is the leading and clever men whose ambitions we have to consider, because in every department of life it is these who influence policy and determine progress. I take it, therefore, that there are three chief motives which inspire men who aim at becoming leaders and rulers in the world.

1. *Love of Power and Influence.*—The truly ambitious man is, very rightly, not satisfied merely with making a fortune; by itself this brings little real and permanent satisfaction and often only ends in the man becoming increasingly fearful of losing what he has gained, like the patient described by Dr. Arthur Ross in his book on "The Common Neuroses," who explained that there was only £200,000 between him and the workhouse. We all give lip service nowadays to the blessed word "equality," but an able man can never really believe in it. Conscious of abilities above the average, he naturally and rightly wishes to exercise his gifts to the uttermost, and he can only do so by becoming a leader and ruler of men.

2. *A Desire for Uniformity.*—The wish to make other people think, speak, and act as nearly as possible as we do ourselves. The keynote of nature is diversity—no two living things are ever exactly alike—but man's ideal is uniformity. Again, as in the case of "equality," we pay lip service to "freedom," but it is much more freedom for ourselves than for others. The more capable, the more earnest, the more convinced a man is that he is right himself, the more determined is he likely to be—especially as he gets older—that it is his duty to make other people think and act as he does, so that if he gets the power to compel others to imitate him, the more certain will he be to exercise it to the full. If that be true of one man, it is still more true of any body of men acting collectively; that is, of a bureaucracy. In either case the desire to exercise power grows with the opportunity of doing so.

3. Lastly, a man, and possibly—though to a much less extent—a bureaucracy, acts under the influence of what is called *conscience;* that is, he wants to be able to convince himself and also other people, that he is not governed by purely selfish motives, but is genuinely desirous of benefiting others. In this way the greatest acts of tyranny and oppression can be, and have been, justified.

The most typical and successful example of the exercise of these three dominant motives in human life is afforded by the history of the Church in the Middle Ages. First of all, by the use of purely spiritual authority and influence, it gradually obtained supreme power over practically every department of human life. Having gained this power, it ruthlessly extirpated every form of what it chose to consider as heresy or schism, and, lastly, it did all this, justified every cruelty and every kind of oppression and tyranny, under the specious plea that it was acting in the true interest of the victims.

Now comes the opportunity for the medical profession to grasp the power which has fallen from the hands of the Church. The idea of eternal punishment, whether for better or worse, no longer exercises much influence over men's lives or minds, and the satirical words of the Eastern philosopher, written thousands of years ago, "Skin for skin, yea, all that a man hath will he give for his life," are probably at least as true to-day as when they were first penned. Assure any man or woman with sufficient emphasis that if he does not follow your advice he will certainly perish miserably of some dire disease, particularly cancer, and in all probability he will follow your instructions, even to the point of unhesitatingly sacrificing any part of his anatomy, as readily as his ancestor centuries ago would have done, if told that unless he propitiated the Church by some suitable and adequate contribution his body would certainly burn everlastingly in hell fire. I am inclined to think that the leaders of surgery, being actuated by exactly the same motives and ambitions as are any other body of men, are to an increasing extent availing themselves of their present-day opportunities.

Medical Control of the Public.

Let us consider how the medical profession is striving to reach, and may hope to attain, the three ideals I have described.

The foundation upon which we may hope to build up power and authority over our fellows must be the Ministry of Health. It might at first seem desirable that the highest official of all, the Minister himself, should be a medical man or a medical woman, but a little reflection will show that this is not really desirable. Here we may learn again from the history of the Church in the Middle Ages. How often do we read of an emperor or king ostensibly supreme, but of the real power behind the throne being exercised by a cardinal or some other ecclesiastic, so that the nominal ruler was left to face the unpopularity of unduly tyrannous or unwise acts for which his advisers were really responsible.

Under the Ministry of Health there would be eventually a complete State Medical Service, such as a large number of doctors already demand. The chief medical officer to the Ministry would occupy the position and have much of the authority of the Pope in the mediæval Church; under him would be a number of inspectors and consultants—or regional medical officers, as they are termed at present—who would correspond in position with cardinals and bishops, whilst to every unit of the population, say to every thousand people or so, would be allotted a doctor who would correspond with the parish priest in the Church, and who might be called, provisionally, the district medical officer. He might have a larger number of people under his care and be given two or three assistants who would be in training for the higher and more responsible post. A separate staff of doctors would be entrusted with the care of the State or municipal hospitals, whilst another branch of the profession would act as medical officers of health, concerned exclusively with preventive medicine, either general or special—such as inspectors of factories and workshops.

To the regional medical officers and their assistants would gradually be confided complete control over the population in their respective areas. It is difficult, indeed, to conceive of any part of a man's daily life, work or play, from his conception in utero until the final disposal of his remains after death, in which health is not concerned in some way or another; and consequently it follows that in every step and department of life the authority of the medical man must ultimately become supreme. The mother would be kept under careful observation throughout pregnancy, the confinement would take place in a maternity hospital, the child would be looked after first at an infants' and later on at a children's clinic; throughout school-life he would be examined repeatedly by the school doctor, who would see that any medical or surgical treatment required was carried out either by the doctor of the family or at a suitable institution. On leaving school his choice of a vocation would be determined largely by the school and family doctors, in consultation with a psychologist, so that there should be no misfits in regard to employment. Necessarily also the doctor would have the final decision in such matters as to where the man should live, his hours of daily and weekly work, the length of holidays, and the date of retirement from employment. Legal compulsion would be essential to support his authority, especially in regard to such matters as vaccination—of course, not merely against smallpox, but for a number of other diseases, especially against diphtheria—and also to ensure that operations essential for the child's well-being were not evaded owing to the ignorance or prejudice of parents. It is interesting to note in regard to this important matter that a commencement is already being made by the taking of proceedings in the police-courts against refractory parents who perversely refuse to have their children's tonsils and adenoids removed. No doubt in a little time patients who neglect to continue treatment for venereal disease until they are nominally cured will be dealt with drastically. Doubtless, also, some method of preventing every acute infectious disease will in time be discovered and its use imposed upon a well-educated population. Most important of all, however, will be the decision which the doctor alone can make as to a man's fitness for marriage and, if fit, as to the suitability of his choice of a partner in life. No marriage would be permitted without previous medical sanction, and a newly married couple might be informed that the State expected them to produce a given number of children at recognised intervals. It would be easy in a Socialist commonwealth to provide suitable punishments for any transgression of these professional directions.

With the district medical officers exercising such powers as I have outlined, it would be necessary in important or difficult matters, such as the question of any major operation, or the necessity of final retirement from work, to allow an appeal to a higher authority, an inspector or consultant, whose decision would be final.

Another matter upon which the medical profession would naturally have the deciding voice is in the use of alcohol, including the desirability of following the example of our American cousins and imposing total prohibition upon the country.

Orthodoxy an Essential.

Coming to our second great aim, that of firmly establishing professional uniformity and orthodoxy, we have two separate problems to consider; first, that of preventing every form or description of medical practice outside our own ranks, and secondly, that of extirpating at its earliest commencement any heresy or schism amongst ourselves.

With regard to unqualified practice the situation at present is far from ideal; the British public still insists upon its right of private judgment, that is, upon its freedom to consult any one who offers to cure or relieve disease, so that quacks of every description are able unrestrainedly to prey upon all classes of the population from the wealthiest to the poorest—especially upon the former—provided always they do not pretend to possess any medical qualification. If the State were well-regulated from the medical standpoint, such wrong-doing would of course not be tolerated for a moment and, naturally, our ambition must be to have all forms of irregular practice made absolutely illegal. We cannot, it is to be feared, expect to be able to enforce the drastic penalties which the Church in the Middle Ages employed against those outside the regular priesthood who endeavoured to usurp any of its spiritual prerogatives, but at least we must aim at the power to inflict punishments which would effectively prevent unqualified quacks from making a living by the practice of any branch of medicine; with qualified quacks it is more difficult to deal. In the meantime we are making some progress by the enforcement in

the out-lying branches of our profession of regulations even more effective than those which we are able as yet to employ among ourselves. I refer to the complete system of examination and registration now legally enforced upon dentists and nurses, and the increasingly effective means of preventing them from practising unless they are registered.

It is obvious that those nurses fortunate enough to get on the Register must be protected fully from the competition of unqualified people, now that they have to attain such a high standard of professional knowledge as is indicated by the ability to answer successfully such questions as: "What are the symptoms of gastric ulcer? From what other abdominal conditions has it to be diagnosed? Give the points of distinction." "Describe the symptoms and signs of tuberculous peritonitis; what are the complications? What preventive measures can be taken against this disease?" "Write a short essay upon the causation, prevention, and treatment of post-operative pneumonia." "What is meant by the term 'Pott's fracture'? How is this fracture caused? How is it treated? What deformity and disability may ensue if it is unskilfully treated?" "What are the various kinds of ulceration of the cervix? Indicate their chief characteristics. What methods of treatment might be employed in each case?"

Probably you imagine these are questions given at a final qualifying examination for medical students; actually they are taken from papers set for the Final State Examination for Nurses.

We come next to the more difficult subject of the maintenance of discipline within our own ranks. Until all medical men are brought completely under the ægis of the State, it would be essential that they should be subject to a strict trade-union control, to prevent such delinquencies as the acceptance of inadequate rates of payment, fee-cutting, or any form of blacklegging. To this union would be consigned the responsibility for medical defence and medical charities, and it would be clearly understood that all practitioners who transgressed its rules would be liable to lose the privilege of medical defence for themselves and all claim to medical charities, either for themselves or their dependents. Incidentally, we note that once all doctors had become State officials they would probably become immune from actions for damages, under the far-reaching constitutional principle that "The King can do no wrong." There remains the question, how to prevent or punish deviation from the paths of professional orthodoxy. For this purpose the powers of the General Medical Council would have to be strengthened, so that any serious heterodox practices might be included under the famous term "infamous conduct in a professional respect," and accordingly dealt with promptly and suitably.

Research will necessarily form an important part of the medicine of the future, but it must be under strict control and on carefully regulated lines. Herein lies the obvious danger that medicine may become static and be governed increasingly by tradition and authority as in the Middle Ages. Research would finally be controlled by the elder statesmen of the profession and age, particularly when combined with power, is always conservative. Minor discoveries and novelties, especially in the matter of new remedies, concerning which people of all ages and conditions are credulous, would no doubt be tolerated or even encouraged, but really far-reaching and important new facts must be subversive of something or other, and hence would be condemned as revolutionary. We must accept the oft-demonstrated fact that as we get older we become less and less receptive of new ideas and, finally, hopelessly enmeshed in the traditions of the past. This is the case usually with individuals, but with groups of individuals it is even more so. The rules, the traditions, the conventions, the customs of a ring of senior bureaucrats must necessarily be almost inviolable, and the junior who comes with some startling new discovery will be fortunate indeed if he can secure hearing and recognition.

Under departmental and official auspices there will be plenty of research of a kind, by the paid man who adopts it as his vocation in life. Nature's born investigators, however, the Harveys, the Pasteurs, the Listers of the future, are likely to have a poor time under official dominance and may well be thankful if they escape professional obloquy, ostracism, and even expulsion as heretics, law-breakers, and as having no respect for authority and tradition. In our lofty intellectual superiority and pride we, of course, feel confident that we could never be guilty of the sins or even the errors of our fore-fathers, but all history teaches us that in these matters human nature and human prejudices remain unchanged through the ages.

The Idealists.

To attain our third object in life and so complete the sum of our ambitions, it remains for us to convince first of all ourselves and then the public that all our motives are purely unselfish and that our time, thoughts, and endeavours are devoted solely to furthering the physical wellbeing of our fellows. We need have little difficulty in satisfying ourselves on this point, for probably we already cherish the idea that we are members of the one profession (apart possibly from the clerical) which wholeheartedly sacrifices itself to the interests of other people. It is essential, however, for us to persuade the general public that by giving us autocratic control of their lives and by strictly obeying our orders, their happiness will be increased, their health improved, and their days prolonged. Doubtless what they will be most unwilling to forego will be the privilege of drugging themselves, but necessarily they must do so, for clearly practice by unqualified people is the same whether exercised on other men or on themselves. What can be more dangerous to health than for the laity to treat themselves? In fact, only a few years ago we witnessed a determined attempt by the medical officials of our paternal State to prevent doctors prescribing dangerous drugs for themselves; an attempt only abandoned apparently when it was realised that it would be exceedingly difficult to prevent a doctor from writing a prescription for professedly some member of his family and then taking the medicine himself. All patent medicines must necessarily be suppressed, despite the protests of an impecunious Chancellor of the Exchequer, and all drugs, except a few of the simplest possible character, as, for instance, so harmless, but indispensable an adjunct of modern civilised life as paraffin, sold only on a doctor's prescription by a properly qualified chemist, just as opium, cocaine, and a few similar drugs are sold to-day.

In our expansive moments, especially in after-dinner speeches, we are already fond of pointing out to our audiences, particularly if non-professional, that we afford an unique example of a profession ever actively engaged in trying to destroy the sources of its own livelihood; and that by doing our best to prevent disease we are always diminishing the number of our potential patients. In fact, in one form or another we repeat the statement so often that there is actually some danger we may begin to believe it, although even this would have its advantages, for the more completely we are convinced that we are unselfishly sacrificing ourselves in the interests of the public, the more likely are we to be able to persuade them to entrust us with ever-increasing powers over their lives and habits.

As a matter of fact we need not be in the least alarmed about our own material prospects, no matter how successful may be our efforts at prophylaxis, for it will always take at least as many medical men to prevent disease as to treat it (advisedly I do not say cure it) after it has developed. As well might the drivers of stage coaches have complained of unemployment when railways were first built, regardless of the fact that the latter would employ many times the maximum number of men who ever drove coaches. It may be that by slow degrees many more men will be employed in preventive—and somewhat fewer in curative medicine (falsely so-called), but the change will be so gradual that no serious inconvenience is likely to arise to individual members of the medical profession.

Medical Despotism.

Such are our ambitions—to attain under the conditions of our present-day civilisation the position, the power, the influence, the prestige which the Church possessed in the Middle Ages; to bring about absolute uniformity and conformity in our own ranks, to extirplate completely every form of irregular and unqualified practice, and to use our powers for the preservation of the health of the community, for the prolongation of their lives, and for the best interests of their bodies, just as the Church used it for the welfare of their souls. It sounds, indeed, a glorious ideal; I can only hope most earnestly we shall never attain it, both for the sake of the public and also, eventually, in our own best interests.

Even if it were possible of fulfilment, the greatest objection of all to it is that human nature is so constituted that the possession of autocratic power in any department of life inevitably converts a man into a tyrant. It would seem that no one man, nor any body of men, is capable for any considerable time of exercising uncontrolled power without being morally ruined as a result. Only by an effective opposition, only by the constant interaction of contending forces, only by the knowledge that if he makes a mistake, retribution will sooner or later overtake him, can a man be preserved from what I ought perhaps to call a superiority complex, from arrogance, conceit, and disregard for the rights and feelings of others. The fact that our motives and purposes in seeking to impose our wills upon other people are of the highest and best only makes matters worse, because if we are firmly and conscientiously convinced that we are unselfishly out to benefit others, then increasingly we feel that the end justifies the means and that we are morally bound to use every possible effort and ruthlessly to overcome all opposition in order to attain that which we feel certain is right. Clifford Allbutt truly said: "Conscientiousness without enlightenment has to account for some of the darkest chapters of human history." A medical despotism, by leading eventually to an inevitable reaction would, like all other despotisms, inevitably bring about its own downfall. Just as the moral despotism of the Puritans during the time of the Commonwealth was followed by the licentiousness of Charles II.'s reign, so the tyranny of hygiene would inevitably be followed by a period of laxity in regard to all the laws of health, especially probably in regard to those moral laws, obedience to which is at least an essential to the real health of a community as is obedience to physical laws.

It is difficult, if not impossible, to draw any hard-and-fast line between enthusiasm and crankiness—the two are often combined. An enthusiast who was also a crank might easily get to the head of affairs and consider it his sacred duty to bring into operation new ideas or fads which might be entirely erroneous. Take, for example, the modern fashion for prophylactic vaccination against influenza. I venture to say that at present our knowledge and experience are far too indefinite to justify us in strongly advising—let alone in insisting upon—this as a precautionary measure; yet I feel sure there are medical officers of health and of schools who, if they had the power, would not hesitate to insist upon the compulsory inoculation of school-children (and preferably of all members of the community) at least once a year.

In this connexion I may refer to the results of a most interesting test made a few years ago at a public school. It was decided by the governing body to inoculate against influenza, before the Christmas holidays, all the boys whose parents were willing. There were about 350 boys in the school, and of these 60 per cent. were inoculated. The inoculation was carried out by a well-known bacteriologist who was most anxious that the experiment should be a success. When the school reassembled after the Christmas holidays cases of influenza soon began to appear, and eventually 113 boys (32 per cent. of the total number in the school) were attacked. It was a remarkable fact that the percentage of boys inoculated and the percentage of those attacked who had been inoculated was exactly the same in each case—viz., 60 per cent. Moreover, the school medical officer reported that there was no difference in the symptoms or type of the disease amongst those who had and those who had not been inoculated; all the cases were mild except that one of the inoculated boys developed slight broncho-pneumonia, but recovered completely.

The Permanence of Regulations: Small-pox and Vaccination.

Another difficulty to be faced under the rule of a medical bureaucracy would be that if once any official procedure were established by law it would be a long and difficult process to get any alteration made to suit different circumstances.

Take, for instance, the case of vaccination against small-pox. Are we adapting ourselves to the marked changes in type of that disease which have developed during the last few years? At present the one endeavour of our medical hierarchy is to get the maximal number of people vaccinated and protected as completely as possible. Let it be granted at once that vaccination does (for a certain number of years) protect against small-pox, the question which arises is whether the present form of small-pox is worth being protected against. Supposing some vaccine were discovered which, for a certain number of years, entirely prevented chicken-pox or mumps, would anyone seriously suggest its universal use? I doubt it, yet both these diseases are responsible for no inconsiderable inconvenience and loss of time during school-life, and for the last ten years chicken-pox has been credited with from 40 to 83 deaths, and mumps with from 14 to 41 deaths annually in England and Wales. Is the present form of small-pox really more serious than chicken-pox? I have no personal acquaintance with it, but so far as I can gather, it very rarely gives rise to pitting and hardly makes those suffering from it feel ill—not so ill as vaccination often does. It is not easy to ascertain for how many deaths it is really responsible as distinguished from those in which it is the nominal, but not the actual, cause of death. In 1926, according to the report of the Registrar-General, 10,146 cases of small-pox were notified in England and Wales and 18 deaths were attributed to it, but the report states:—

"The figure quoted is probably overstated, that accepted by the Ministry of Health being 11. The number 18 is arrived at by the application of the rule of tabulation long followed in this country. Under it all deaths on the certificates of which mention is made of small-pox are assumed to have been caused by it unless violence or certain other causes catalogued on page xxii of the 'Manual' of the International List are simultaneously recorded. During 1926 only one death, of a male, aged 58, suffering from cancer of the stomach, was excluded from the small-pox heading under this rule."

We may take it, therefore, that at the very most only 11 deaths were attributable to small-pox in 1926, a mortality of just over 0·1 per cent., or 1 in 1000 cases. In 1927, 14,764 cases of small-pox were notified, and 47 deaths (0·32 per cent.); but no official particulars are as yet available concerning these deaths. Further information as to the entirely misleading character of the present system of registration of deaths from small-pox is afforded by the following facts gathered from the pages of THE LANCET in regard to the first six months of the present year.

During that period 21 deaths were registered from small-pox in the great towns of England and Wales, including London. Concerning 14 of these cases the following interesting and instructive statements are made:—

Three who died in hospital near Bradford are said to have been debilitated subjects, aged 71, 73, and 75 respectively; the certificate of the cause of death in one of them was "myocarditis, senility, small-pox." In a fourth case the certificate was "subacute nephritis, chronic bronchitis, discrete small-pox." In another instance, a woman was in hospital from Dec. 2nd to 17th, 1927, with very mild small-pox; she died on Feb. 2nd from "pericarditis, debility following small-pox, tuberculosis of lungs." In a sixth

instance the certificate was—"ulcerative endocarditis, small-pox."

One fatal case was that of a premature infant; another, a woman, aged 66, "in frail health," cause of death "senility or debility, small-pox"; another was a woman, aged 73, admitted to hospital on Feb. 13th for a mild attack of small-pox; she felt quite well, and remained so till Feb. 29th, when she developed slight bronchitis; on March 3rd she had almost completely recovered, and was to have been discharged on the 8th or 9th, but on March 4th she collapsed and died suddenly. It was stated she had been subject for several years to periodical heart attacks.

Another patient, aged 51, suffered from mild small-pox, but the primary cause of death was pernicious anæmia. A man, aged 77, was stated to have been in a septic condition and very feeble before he contracted small-pox. In another patient the primary cause of death was neoplasm of the lung, and in yet another the patient, when admitted to hospital for small-pox, was suffering from hemiplegia and diabetes, with diabetic gangrene of the toes; the small-pox was said to be a factor of small contributory importance to his death. A child who had mild small-pox with no systemic disturbance developed acute primary pneumonia from which she died; it was stated that the small-pox could have had no appreciable bearing upon the causation of death.

Such are the people who form the majority of those who nowadays are said to die from small-pox! Is it not obvious that the present system of registration is grossly inaccurate and that the real mortality from the disease must be almost negligible?

Circumstances versus *Creeds.*

An exceedingly mild form of small-pox has now been epidemic in this country for several years; ought we not seriously to consider whether a disease which causes such slight constitutional disturbance, such an almost inappreciable number of deaths, and so few—if any—after-results, really calls for the elaborate and most expensive system of hospital isolation which we maintain for it, especially as we are told that in some districts it is considered preferable to have a pleasant three weeks in hospital with small-pox than to suffer from vaccination at home. Also, if the disease is really not more serious than chicken-pox, let us treat it accordingly and not try to prevent it by giving another disease which may cause as much, or more, constitutional disturbance, and in some cases as long, or even a longer period of incapacity for work.

The results of vaccinia are not absolutely negligible and, unfortunately, whilst the number of deaths from small-pox is now certainly much over-stated, there is a possibility that those from vaccinia may be understated. Moreover, it is now recognised that in a certain number of cases recently the vaccination of children previously perfectly healthy has been followed by an obscure condition of encephalomyelitis which not uncommonly proves fatal.

Once again, I ask: "Is protection against the present type of small-pox worth the price which is being paid for it?" That it really is small-pox seems to be established by the fact that vaccination efficiently protects against it, and the official argument is that at any time it may develop into the original virulent Eastern type, and that in view of this possibility universal vaccination should still be enforced as far as possible. The answer would seem to be that the long-predicted epidemic of severe small-pox does not materialise, and that such limited outbreaks as undoubtedly have occurred in recent years have been controlled without difficulty by efficient quarantine and immediate vaccination of all contacts. In Leicester and many other large towns the proportion of those protected by vaccination must now be exceedingly small. Yet we do not hear of the occurrence of any serious outbreak of small-pox. That the matter really calls for careful consideration is clearly indicated by the recent Report of the Committee on Vaccination which was appointed in 1926. It recommends that a very modified form of vaccination be tried which, whilst it might not protect against small-pox for so long a period as the older and more drastic method, would at any rate not be likely to cause so much disturbance either local or constitutional, and might, therefore, become more generally acceptable to the population. Should this modified procedure be adopted the results will be awaited with interest. Evidently our views about vaccination are changing; they would probably change even more quickly had it not become a part of the official creed, established by law and therefore as dogmatic and as difficult to alter as the Athanasian Creed itself.

The Profession Self-enslaved.

Whilst, for reasons already given, I believe a medical autocracy would be thoroughly bad for the public generally, I feel equally sure that in the long run it would be equally injurious for doctors themselves. It is often the case in life that the most disastrous thing which can happen to a man is to be uniformly successful in the attainment of his ambitions, and there is no reason why medical men should be exempt from this rule, even were it conceivably possible for them to reach their ideals and so control in large measure—however beneficently—the lives and destinies of their fellow creatures. Such a change could, of course, only be brought about by a most complete organisation and by the closest possible alliance with the State. The result would necessarily be that, however much power the medical profession as a whole might acquire, its individual members, even those most highly placed, would merely be slaves in or of the organisation they had created, having implicitly to obey its rules and conform to its methods, entangled in ever-growing coils of official procedure and red tape. Individualism, at present I consider one of the chief glories of medical practice, would be destroyed; to an increasing extent we should become mere automata, acting within narrowly defined limits under the guidance of orders of superior officers whom, in our own interest—for purposes of advancement and so on—it would be essential always to conciliate. Even the head of the entire professional organisation, presumably the chief medical officer of the Ministry of Health, would no more be a free man than is the Pope, the self-made prisoner in the Vatican. He would be hampered in every direction by precedent, custom, and tradition. All life, all initiative would be extinguished, originality would be discouraged, research, as I have already pointed out, confined within strictly defined limits, and in enslaving others we should ourselves become the greatest slaves.

For two things we need constantly to strive, the first is humility—for an acute realisation not so much of the comparatively little we know as of the enormous extent of our continued ignorance; to realise also how many and insidious are the pitfalls which ever beset us alike in diagnosis, in prognosis, and in treatment; how easy it is to draw false deductions and especially, because it enhances our intellectual pride and our reputation with others, to attribute to our own skill that which is really due to nature. We are probably only too apt to think anything new arising outside our own ranks must necessarily be worthless. The danger is that any body of men who acquire knowledge, especially about the human body, much beyond that possessed by the rest of mankind, are apt to give themselves quite unnecessary airs of superiority which, in the long run, certainly do not win for them the respect or esteem of their fellows.

The second object at which we should constantly aim is the maintenance of our freedom. How true is the old saying that the price of freedom is eternal vigilance, whether it is personal, religious, political, or professional freedom. Man is so constituted that, as I have pointed out already, he is always trying to gain control over his fellow men. In medicine this can only be effected by close alliance with the State, in other words, by means of a State Medical Service in a Socialist commonwealth. This entails the extinction of individualism and the loss of freedom, with all its paralysing effects on originality and progress. No gain can possibly be commensurate with so great a loss.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS.

A MEETING of this Section was held on Oct. 9th, when Prof. J. A. GUNN read a presidential address, opening a discussion on

CARDIAC STIMULANTS.

Prof. Gunn said that confusion occurred owing to discrepancies between the clinical findings and the pharmacological evidence in regard to a number of substances, but in regard to certain drugs which were usually included in the class of cardiac stimulants the confusion was especially pronounced. There had been little agreement between clinicians and even less between pharmacologists. He had consulted text-books with the object of arriving at what was the general opinion on the points at issue, but it was remarkable that, in spite of the quantity and quality of the researches made in recent years, he found scarcely anything which could be regarded as a real consensus of opinion on the therapeutic value of the drugs in this group.

The circulation of the blood could be regarded as a distributory scheme designed to supply the organs of the body with blood, with all that that fluid implied, according to the separate demands of each organ. If the composition of the blood was normal the crux of the sufficiency of the circulation in any organ was the rate of flow of the blood through it; it depended on the pressure of the blood and the calibre of the vessels. The collecting side of the circulation was of equal importance, because if the continued uniformity of the circulation was to be maintained, as much blood must be returned to the heart as was pumped out of it in a given time. It was long before he realised that the important part of the circulation was the capillary part; it was, indeed, for this that the circulation was designed. Broadly, physiological research had proceeded from a consideration of the wholesale distribution to the return delivery. Here, as in other matters, research had proceeded along the line of ease of observation, and especially ease of measurement. Two of the most difficult aspects were the capillary circulation and the venous return.

In considering cardiac failure and cardiac stimulants, it was first necessary to ask whether the physician and the pharmacologist had brought themselves into line with the advances in knowledge concerning the circulation; and the answer to that must be "not yet." There was a tendency very prevalent just now to apply to a case the term "cardiac failure" when the heart condition had nothing to do with the failure of the circulation, though of course every failure in circulation was reflected in the heart beat.

The Need for Classification.

Much of the present confusion as to cardiac failure and cardiac stimulants was due to a lack of proper classification, without which no real progress could reasonably be expected. An example of his meaning he drew from his own experience. Twenty years ago he had a prolonged fainting attack, due to undisciplined smoking. His pulse-rate was 40, and he regarded his case as one of vagal stimulation. The large dose of belladonna which he took promptly changed the pulse to a reasonable rate. Now inhalation of ammonia was used as a cardiac stimulant and it was a powerful stimulator of the vagus centre; in his own attack, however, the use of ammonia would have made matters worse. Again cardiac failure might occur early in chloroform administration, or from ventricular fibrillation, or late in chloroform administration from paralysis of heart muscle with central vasomotor and respiratory paralysis. In the first kind adrenalin, if it could be got to the heart, would do more damage than good, while in the second kind it might save the life of the patient. One of the most dramatic improvements he had seen occur in the pulse was that which followed the intravenous injection of pituitary extract in a case of intestinal atony. But pituitary extract exerted no effect on the heart; its action was on the small arterioles and on the capillaries. Thus it was necessary to separate out the cardiac failures and also the cardiac stimulants. The utilisation of present knowledge, as well as the making of further advances, was being seriously handicapped by the want of a proper classification.

No classification of cardiac stimulants was possible unless the term was accurately defined and realised. Usually a stimulant was understood to be something which produced a prompt but transient increase of activity of an organ; though under conditions in which such a fillip might break a vicious circle, the effect might be lasting. A tonic meant something causing increased activity or tone, which was brought on more slowly and was more enduring. Prof. Gunn then proceeded to consider some of the drugs which had been regarded as cardiac stimulants and to suggest possible explanations for the present discrepancies of opinion in regard to them.

Strychnine.

It was agreed that under certain circumstances this drug caused increased excitability of the central nervous system, and of the vasomotor and respiratory centres especially. It was equally agreed that strychnine had no direct action on heart muscle, for instance, on the perfused heart. He had seen astonishing improvement in the pulse and circulation ensue in an almost moribund patient following upon the injection of gr. 1/8 of strychnine. But how did it act? Not on heart muscle, and he did not think strychnine ever saved a life. It raised the aortic pressure and drove that added quantity of blood through the organs which was needed for the immediate continuance of life. The heart was improved by increasing the supply of blood to the coronary vessels. There was a lack of agreement as to when—if ever—it should be used, and as to what was its therapeutic value. It was useless to employ strychnine except when the primary failure was vascular, not cardiac. The reaction of the nervous system to stimulation depended on its state of excitability at the time. If the vasomotor centre was so depressed—as by the action of toxins—strychnine might have little or no effect. If the vascular failure was capillary stasis, or if the vessel walls had lost their excitability, stimulation of the vasomotor centre would not accomplish anything. With regard to dosage, it had been said that less than a dose of 1/10 of a grain was of no use; the only effect he had seen follow the use of the drug was when it was given in doses of gr. 1/10 to 1/8.

Alcohol.

On this drug the literature was a vast one. The antagonistic views with regard to its action were due to the fact that it had been administered in two different ways. Small amounts of whisky and brandy had been given for faintings in more or less healthy people, and he agreed that some improvement in the circulation followed this practice. The effect occurred too soon for it to be due to its influence after absorption; it must be a reflex effect, for in this concentrated form it must cause cerebral stimulation. That neat brandy caused no marked reflex effect on the healthy person did not mean it would have no effect on a patient who was semi-conscious. And though brandy might cause a reflex effect on the medullary centres in temporary circulatory failure, it did not follow it would have the same effect on a patient with the gradual circulatory failure which was associated with a long illness. Most pharmacologists believed that alcohol had no direct stimulant action on the heart, and experiments had shown that it did not markedly influence blood pressure. It was undoubted, however, that alcohol after absorption caused some redistribution of the circulation; the flushing effect was easily seen. When absorbed it was not clear that alcohol altered the blood pressure. Prof. Gunn objected to

the statement so often made that though a drug might not do good, it would not do harm; a drug did not leave matters as they were.

Camphor.

A corresponding dispute had arisen as to the effects of camphor; there was an extensive and contradictory literature on the subject. Camphor had been largely used as a stimulant in circulatory failure. There was no evidence of its direct action on cardiac muscle. When injected hypodermically it acted as a local irritant and reflexly stimulated the medullary centres. It had the same limitations as alcohol. It was held to have a beneficial effect on the circulation after it was absorbed, but views on this differed acutely. It had a dilating effect on the coronary and the skin vessels.

Adrenalin.

Here the pharmacologist was on firmer ground. Adrenalin had the same action in health and disease; it was a peripheral sympathetic stimulant, and the most powerful known stimulant of the heart. It contracted most of the arterioles, so that injection of it caused a prompt, steep, and high rise of blood pressure. There was a constriction effect, mainly on the splanchnic vessels, and those of heart and lungs were dilated. In conditions in which a low blood pressure and a feeble heart were injurious, adrenalin, by altering the blood distribution and increasing the cardiac output, might cause a lasting improvement in the circulation. Its action was independent of the condition of the central nervous system at the time; in the case of tissue which had been kept in cold storage, as long as the muscle was alive adrenalin would still show some action. Adrenalin was, however, a two-edged weapon. It acted best when given intravenously, and in a slight overdosage it was a powerful poison, throwing a heavy strain on heart and vessels. Therefore its use had been confined to cases of forlorn hope. It had been used repeatedly, often with success, for complete or threatened arrest of heart. Probably increasing familiarity with its action would enable it to be given as repeated injections for acute cardiac failure.

Pituitary Extract.

The action of this drug was relatively simple. It contracted the capillaries and small arterioles, not discriminating between the splanchnic and other vessels. It had no action on the heart. In regard to the circulation, it was useful only when it was desired to contract the arterioles and the capillaries. In capillary paralysis, pituitary extract had no effect, although in some patients it might bring about a transient improvement in the circulation.

A Better Terminology.

How should a cardiac stimulant be defined? Various definitions were possible—e.g., (1) It could be defined as anything which would improve the output of the heart, and would include substances which had no action on the heart at all. (2) It could be stated to be anything which caused increased ventricular action in a heart acting under constant dynamic conditions. This last was the desirable definition. There was no reason why syncope should be classed as cardiac failure, whether due to overaction of the vagus or to dilatation of vessels. Prof. Gunn looked forward to the time when descriptions of diseases would no longer include mention of "cardiac failure," substitutive terms being "paralysis of heart muscle" or "paralysis of vasomotor centre," or "of the capillaries"—whatever the primary trouble might be, with a corresponding improvement in therapeutic practice.

Discussion.

Dr. KINGSTON BARTON, speaking as one who would be called a non-alcoholic doctor, asked how it was that a faint or exhausted patient quickly revived when given a stiff dose of brandy. Doubtless it was, as the President said, by causing a redistribution of the blood. A free dose of brandy every half hour during the crisis in pneumonia would similarly restore the patient to obvious life.

Dr. G. A. SUTHERLAND said his view had long been that there was no such thing as a cardiac stimulant, and Prof. Gunn seemed, as the result of his experience and his experiments, to hold that view also. The term was really a misnomer. A liver stimulant meant an agent for promoting the flow of bile, but that had no parallel in the case of the heart, which had many structures, nervous, conducting, muscular. In heart failure it was necessary to consider which part of the heart was affected. Adrenalin acted chiefly in disturbances of the conducting tissue. He did not think any known drug would go direct to the heart muscle and stimulate it.

Dr. JOHN PARKINSON said the point under discussion would be decided by settling the requirements of individual varieties of cardiac failure. He thought sudden circulatory failure should be subdivided. One knew the ordinary cardiac failure accompanying auricular fibrillation, cardiac failure without such fibrillation, with auricular flutter, and with paroxysmal tachycardia. The subject would be simplified when it was known when and how patients got sudden circulatory failure. But there was a special difficulty in applying remedies in such conditions owing to Nature's care of the heart. It could cease to beat for a long period, and yet repeatedly recover itself. Moreover, Nature had shown herself capable of doing all that the physician hoped to do by means of the alleged cardiac stimulants; sometimes the patient in an acute condition had recovered before the arrival of the specialist. If a patient was collapsed from auricular fibrillation quinidine might prove to be exactly the remedy required to restore the normal rhythm, though it was not regarded as a cardiac stimulant. With regard to alcohol, that it had an effect on the circulation after absorption was quite evident from the flushing, and its use for so long a time seemed to have been justified especially in continuous failure.

Prof. E. B. VERNEY agreed it was important to divide cardiac muscular stimulants into the two chief groups; (1) those having a direct action on cardiac muscle; (2) those which improved the condition of the heart muscle by increasing the arterial blood pressure, leading to an increase in the coronary flow. It was also necessary to define accurately what was meant by the term "cardiac muscular stimulant." He drew attention to the views of the late Prof. Starling on this subject. Starling's idea was that such a stimulant was one which caused the heart to perform the same amount of work on a shorter length of fibre. On this conception adrenalin could be regarded as a cardiac stimulant.

Dr. T. IZOD BENNETT declared his belief in camphor given intramuscularly as a cardiac stimulant, but it should be used in a dosage of grs. 20 to 30 at one administration. Strychnine he considered of value in circulatory failure, but chiefly in the type of case in which there was marked cerebral depression.

Dr. D. E. BEDFORD criticised the nomenclature under which various remedies were set out in the medical journals, remarking that it was a pity that the purveyors of medicines did not describe more accurately the substances they were advertising. In his hands most of them had been useless. From the practical point of view, by "cardiac failure" one meant (1) congestive failure, (2) sudden collapse.

The PRESIDENT, in his brief reply, asked that the clinician should try to subdivide his cases a little more. In making comparisons it was necessary to be sure of the dosage.

PAYING PATIENTS AT GOLDEN SQUARE HOSPITAL.—Twenty rooms for paying patients are about to be opened at the Throat, Nose and Ear Hospital in Golden-square, W. There will be a charge of 6 guineas a week with "a moderate fee" to the surgeon.

Reviews and Notices of Books.

ADDRESSES ON SURGICAL SUBJECTS.

By Sir BERKELEY MOYNIHAN, President of the Royal College of Surgeons of England. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 348. 28*s*.

Sir Berkeley Moynihan has collected in this volume a number of addresses and essays of which many will be known already to regular readers of current medical journals, and it is a tribute to his skill, both as orator and essayist, that the new and the old are alike interesting and pleasantly easy to read. There is a unity of theme running through the whole of this book which is due partly to the fact that the author is propounding his faith in surgery and surgeons, and partly to the fact that all the essays, with one exception, first appeared in the years 1925–27. The author apologises in his preface for the fact that there is a certain amount of repetition; but no apology is necessary, as the repetitions indicate clearly the trend of his thoughts on surgery and his admiration for the surgeon and investigator who, more than any other, seems to have captured his imagination. It is natural that the name of Lister should appear prominently in a series of addresses, of which some were delivered in connexion with his centenary celebrations in 1927. But Lister and his work are quoted quite apart from the centenary celebrations; and it is hardly too much to say that this is a volume of praise of Lister and of the work which made modern surgery possible and safe. An oration which stands alone by reason of the time at which it appeared is the first Murphy Memorial Oration delivered before the American College of Surgeons in 1920. The impression that this was a great pronouncement is confirmed by a second reading. It is one of the finest portraits of a great man of a previous generation which has ever appeared to enrich medical literature. With the orator we do indeed see Murphy's tall, gaunt figure; and we almost feel the orator's surprise that this handsome man of Irish descent should have had a harsh and unpleasing voice—surprise, however, which was soon forgotten as the subject of his discourse fascinated the hearers.

There are four clinical lectures in the volume—on the perforation of gastric and duodenal ulcers, on the relation of aberrant mental states to organic disease, on acute pancreatitis, and on the gall-bladder and its affections. Each is an epitome of the author's experience of a disease or catastrophe of which he has an unrivalled knowledge. Cancer is dealt with in the Hastings Popular Lecture, and the layman could read no more scrupulous or careful exposition of the successes and limitations of medicine and surgery in its treatment and cure. The figures given, from the records of the Leeds General Infirmary, of the percentage of cures obtained by a radical operation in carcinoma of the breast, when the disease is still confined to the breast, prove once again that early operation gives an excellent chance of cure. These figures are very similar to those published in a recent report from the Ministry of Health after an independent investigation.

The publishers are to be congratulated on a collection of essays and addresses which are so characteristic of the author and of such permanent value.

MEDICAL INSURANCE EXAMINATION.

Modern Methods and Rating of Lives for Medical Practitioners and Insurance Officials. By J. PATERSON MACLAREN, M.A., B.Sc., M.B., C.M., J.P. London: Baillière, Tindall and Cox. Pp. 312. 16*s*.

THE problems of insurance medicine have now developed a very considerable literature; in America, indeed, there is a definite tendency towards specialisation in this branch. It is becoming increasingly recognised in this country that a medical examination for life assurance demands a careful and systematic routine, and that the assessment of damaged or substandard lives involves a more accurate knowledge of prognosis than can be acquired from an ordinary text-book. The function of the occasional examiner is to look at the proposer carefully, both in regard to his family and personal history, his physique, and the condition of all the systems of the body. He should then give an assessment of his general health, and of the significance of any departure from the normal. The function of the chief medical officer is to apply his greater experience and his knowledge of the actuarial studies of various diseases and their effects upon longevity, and so to suggest a rating, which, however, is often subject to review or modification after consultation with the actuary of the company. To produce a book which shall be of value to both these medical men is no easy task; Dr. Paterson MacLaren has succeeded in achieving it because his book is the outcome of his own difficulties in the early stages of this work. He gives valuable suggestions to the occasional examiner, demonstrates that insurance examinations and assessments are not matters of rule of thumb, and devotes much attention to the details of physical examination. Some of the material given is elementary, but it is none the less essential. The importance of accurate blood-pressure readings is stressed and especially the value of the diastolic pressure record. We would add to this advice that medical examiners should indicate the method employed to determine the diastolic reading. This record is now admittedly of great importance, but until some uniformity of method is adopted, the chief medical officer is bound to regard as suspect abnormal readings which do not fit in with the other observations of the proposer.

The section of the book devoted to diseases as insurance impairments is perhaps the most useful part. Valuable suggestions as to the "loading" to apply for special and individual diseases, defects, or operations are presented, and wherever possible, reasons are given or authorities are quoted. Combining as he does a good knowledge of the literature with practical experience, Dr. MacLaren has been able to produce a helpful book which we commend to our readers.

THE THEORY AND PRACTICE OF RADIOLOGY.

By BERNARD J. LEGGETT, M.R.C.S. Eng., L.R.C.P. Lond., A.M.I.E.E. London: Messrs. Chapman and Hall. 1928. Vol. I.: Electrical Theory and Applied Radiology; pp. 238; 18*s*. Vol. II.: The Physics and Measurement of X Radiation; pp. 307; 25*s*. Vol. III.: X Ray Apparatus and Technology; pp. 550; 42*s*.

UNDER this comprehensive title the author has endeavoured to compile a complete review of radiology, and so far as the first three volumes are concerned he has succeeded well. Vol. IV., which is to deal with diagnostic and therapeutic radiology, is still in preparation. The author has not included radium or radium therapy in his scheme, and has devoted three out of four volumes to the physical and engineering aspect of radiology, whilst the medical aspect is to be condensed into a single volume, which can hardly be so exhaustive as the first three. Vol. I. is a text-book of electricity and magnetism in so far as these subjects concern radiology. The author has not, as is so often done, endeavoured to eliminate the mathematical aspect, but has set it out in such a manner as to be comprehensible to medical men with a knowledge of and liking for mathematics. We venture to think they are more numerous than is usually assumed by authors of medico-physical literature, and it is obviously quite impossible to separate the physics of radiology from its natural and fundamental mathematical basis. In each chapter the author has included a series of questions, analogous to those set in the Diploma in Medical Radiology and Electrology and in the Membership of the Society of Radiographers examinations, which might have been

even more useful to the student had an appendix with answers been included in order that solutions might be checked. The volume is profusely illustrated with photographs and diagrams, and the text provides a clear account of the electrical principles underlying the physics and measurement of X radiation, which is dealt with in Vol. II. This second volume is particularly useful, as it brings together into one book the knowledge of physics required by the radiologist. Dr. Leggett has made a very thorough search for relevant material, and the book contains much interesting matter that it would be very difficult to find elsewhere. An appendix embodies the protection recommendations adopted by Britain, U.S.A., Germany, Sweden, and Russia. Vol. III. deals with X ray apparatus and technology, and here again the author has gone widely afield for his information. Descriptions of apparatus and the manufacture of apparatus, including high vacua tubes by manufacturers throughout the world, are included. This book is, however, very much more than an instrument-maker's catalogue, since it contains a vast amount of information on the use of the apparatus and the principles involved in its manufacture. The last third of the book deals with the radiological building, and contains a full description with plans of the large modern departments in Europe and America as well as those of this country. It is a section that will give much useful information to those designing and equipping an X ray department.

The work, when complete, should prove of great value to students and radiologists.

REQUISITES AND METHODS IN SURGERY.

By CHARLES W. CATHCART, C.B.E., M.A., M.B., C.M. Edin., F.R.C.S. Eng. & Edin., Consulting Surgeon, Royal Infirmary, Edinburgh; and J. N. JACKSON HARTLEY, O.B.E., M.B. Edin., F.R.C.S. Eng. & Edin., Surgeon, Cumberland Infirmary, Carlisle. Edinburgh: Oliver and Boyd. 1928. Pp. 476. 12s. 6d.

THIS is a book of somewhat novel scope. The authors state that it has been written as a guide for senior students, house surgeons, and general practitioners at home and abroad, and a first inspection of the contents suggests that it is another addition to the already long list of books on minor surgery. Closer inspection certainly shows that this branch of surgery is adequately presented, but the inclusion of chapters on post-mortem examinations, medico-legal subjects (including poisons and their antidotes), and even hospital economy justifies the claim to be more than a text-book of surgical methods. Some may feel that the authors have attempted to deal with too many subjects not essentially surgical, and that the book in consequence lacks the cohesion and balance which come from the careful consideration of a more limited field. But no young surgeon can read it without adding to his stock of useful experience.

MICROBIOLOGY.

An Elementary Text-book of General Microbology. By W. GILTNER, Professor of Bacteriology and Hygiene, Michigan State College. London: J. and A. Churchill and Co., Ltd. 1928. Pp. 471. 99 Illustrations. 15s.

IT seems to be a common event in the United States for a course of bacteriology and protozoology to be taken in a university career of general culture, and a number of text-books represent a line of teaching which is rare in this country. This volume gives a comprehensive survey of all the varied aspects of microbes and their activities, pure and applied. The most original thing about it is the author's preference for "microbology" as the name of his subject. For an introduction to the science of small life it is crammed with far too much detail; it would form the syllabus for a splendid whole-time course of lectures and practical work extending over about two academic years, but we fear it is hardly likely to be used in that way.

BOOKS FOR NURSES.

Gynecology for Nurses. By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Professor of Clinical Gynecology, Washington Medical School. London: Henry Kimpton. 1928. Pp. 281. 12s.

THIS book is written by a distinguished American gynæcologist "to present the details of gynæcological nursing in such a way as to be of real help to the physician in securing accurate execution of his orders in the care of those patients, and of real help to nurse supervisors in training their student-nurses." The first part gives a survey of pelvic anatomy, physiology, and pathology, and of the diseases of the pelvic organs and methods employed in their diagnosis and treatment, operative and otherwise. The second part presents the various aspects of the nursing of gynæcological cases, chiefly as carried out in the Barnes Hospital and Washington University Dispensary. The book is profusely illustrated; there is a picture for every day in the year, Sundays included.

The opinion to be formed of the usefulness of a work of this kind will be largely determined by the reader's view as to how a nurse should be trained. Now that this country has adopted the principle, for better or for worse, that a woman can only become a nurse by passing through the gateway of examinations, it must be agreed that this type of text-book has its place. Examinations apart, the many highly technical and complex procedures described therein will be of value to the small percentage of nurses who are cast for a part in a gynæcological theatre. What is to be feared, however, is that a smattering of book-learning and medical knowledge may be allowed to replace a lengthy apprenticeship in the observation and care of patients and that method of acquiring the details of nursing duties which consists of carrying them out frequently under strict supervision and discipline. The pictures of operative procedures, for the most part taken from the author's well-known Operative Gynecology, are, in our opinion, not required by a nurse, and we have grave doubts of any benefit obtained from histological sections of menstruating endometrium and such like, especially as the textual descriptions are too brief to be instructive.

The book will be useful to sister tutors and others engaged in training and lecturing to nurses. To some nurses it may be like a cookery-book to a cook; it will not make her a cook, but will help her on special occasions or for special purposes. The nurse must learn her work by the longer and more tedious process of doing it practically in a hospital with high ideals of service and a high standard of efficiency; with such training a book of this kind may serve its purpose; without it, all books are useless. Excellent as it is, its sphere appears to us a limited one.

Dietetics for the Nurse. By I. STEWART, S.R.N., Examiner for the General Nursing Council, Scotland; Sister Tutor, Victoria Infirmary, Glasgow. London: The Scientific Press, Faber and Gwyer. 1928. Pp. 200. 4s. 6d.

Miss Stewart has prepared a text-book of those elements of modern dietetic treatment which must be mastered by nurses preparing for State examinations. The subject is a wide one, and much information is amassed in small space. The first three sections of the book, comprising chapters on dietetic principles, digestion, absorption, metabolism, and food values will require concentrated study on the part of the average student if she is to grasp the facts set forth. Many students would find them so closely packed with scientific terms as to be difficult to assimilate intelligently in the limited time available for study, unless the book followed out instruction previously given in lectures, which it is evidently intended to do. Having mastered these difficult sections, the reader will pass on gratefully to the chapters on diet in disease. These should be of great value to the nurse in helping her to follow

with intelligence the treatment being carried out upon patients in the wards around her. Every nurse—and the author particularly mentions the home nurse in her preface—will be glad of the numerous recipes provided at the end of the book. There are also interesting tables of comparative food values and contents, which will be appreciated by the more advanced student. A good index completes a little book which is sure to be useful, not alone to nurses beginning their career, but also in perhaps greater degree to ward sisters who wish to keep abreast of modern teaching.

Text-book of Anatomy and Physiology for Nurses and Masseuses. By R. H. ROBBINS, M.D., B.Ch., M.R.C.S., L.R.C.P., M.A., Assistant Lecturer and Senior Demonstrator, Anatomy Department, St. Mary's Hospital. London: Same publishers as above. 1928. Pp. 411. 10*s.* 6*d.*

BASED as it is on the requirements of the syllabus of the Chartered Society of Massage and Medical Gymnastics, this book should be highly acceptable to those preparing for these examinations and should at the same time make a ready appeal to nurses entering for the State examination or the diploma in nursing. To deal adequately with both anatomy and physiology in one small volume is not easy, and it might have been better to allocate a separate book to each subject or, alternatively, to expand the work. The appendices will be found useful and also the glossary of technical terms.

Materia Medica for Nurses. By A. MUIR CRAWFORD, M.D., F.R.F.P.S.G., Professor of Materia Medica, St. Mungo's College, Glasgow; Assistant Physician, Royal Infirmary, Glasgow. London: H. K. Lewis and Co., Ltd. Pp. 86. 3*s.* 6*d.*

THE virtue of this small book lies in the summary form of dealing with an exhaustive subject. One of the most interesting chapters is devoted to sources from which drugs are obtained, and forms a sound foundation upon which to base information as to their properties. Only those medicaments in common daily use have been considered, but references to vaccines, sera, and the important therapeutic substances obtained from the animal kingdom are included. This book is well arranged and its price brings it within the reach of every nurse.

HÆMOGLOBIN.

The Respiratory Function of the Blood. Second edition. Part II. Hæmoglobin. By J. BARCROFT. London: Cambridge University Press. 1928. With 63 Text Figs. Pp. 200. 12*s.* 6*d.*

Prof. Barcroft continues the instalments in which he is issuing the second edition of his book. This one deals with hæmoglobin as a chemical substance; it ends with a particularly clear illustration of the fact that hæmoglobin, as such, is not the same thing as hæmoglobin inside red corpuscles, and this aspect of the respiratory function of the blood is reserved for a third volume. Great advances have been made in recent years towards an understanding of the constitution of hæmoglobin, especially from the comparative point of view, and Prof. Barcroft gives an eminently clear, and what is more, readable account of the changes which have come about. It is particularly interesting to see how the pioneering observations of Dr. MacMunn, made in a shed at the bottom of his garden in the intervals of a busy practice at Wolverhampton, have at last ripened, along with those of Dr. H. C. Sorby, of Sheffield, into conspicuous new fields of knowledge. No one interested in hæmoglobin can possibly do without the book; it is not a complete encyclopædia for reference, but an informative account which cannot fail to stimulate further work. The provisional state of our present knowledge is clear.

New Inventions.

AN EXPANDING ARTIFICIAL AIRWAY.

THE expanding artificial airway shown in the illustration is designed to hold forward the base of the tongue and the epiglottis during the prolonged administration of anæsthetics. It is placed in position with the posterior ends in apposition, forming an ordinary flattened tube. By means of a small screw the posterior portion is then made to open, as shown in the diagram, the lower and anterior portion carrying with it the base of the tongue. Counter-pressure, to prevent the airway being pushed out of the mouth when it is opened, is secured by the projecting plate on the upper surface, which, being inserted behind the upper incisors, limits movement in a forward direction. Provision for edentulous patients is made by two holes, one on each side of the forward opening, wherein tapes can be inserted and tied behind the head. I have found this airway of the utmost value in long operations on the head and neck, where it is essential for the anæsthetist to be out of the way of the surgeon, and the necessity for the introduction of endo-tracheal catheters is thereby avoided in a larger number of cases. In addition, the clear airway ensured greatly increases the safety of the patient and the comfort of the nursing staff during the transport of an anæsthetised patient from the operating theatre back to bed, as the jaw does not have to be held forward constantly. It is necessary for the patient to be well under and properly relaxed before the airway can be introduced, otherwise some trauma may occur in introducing it, and the tongue, if rigid, is not gripped and pushed forward. Once in place, however, the airway will be found to be tolerated with a much lighter degree of anæsthesia.

The apparatus is made by Messrs. A. Charles King, Ltd., 34, Devonshire-street, London, W.

REGINALD KARN, *M.C.*, M.R.C.S. Eng.

London, W.

BONE SHEARS.

THE principal point about the bone forceps here illustrated is that they have a shear action which enables one to cut the rib, leaving a perfectly clean uncrushed surface, and using the minimum of force. The character of the blades enables the blade to be inserted under the rib, even when the ribs are close together, with the minimum of risk of damaging other parts, and the blades can also be slid along the ribs under the tissues and so cut even at a distance, if necessary, from the wound. To accomplish this a right and left handed pair are necessary. The whole design gives maximum strength with a minimum weight.

The Holborn Surgical Instrument Co., Ltd., are the manufacturers.

H. MORRISTON DAVIES, M.D. Camb., F.R.C.S. Eng.

Ruthin, N. Wales.

A STREET-SWEEPER'S COLLECTION.—Mr. Edward Goodwin, a Derby street-sweeper, has, since 1919, collected £1750 for the hospitals of that town. He obtains the money by regular visits to clubs, public-houses, and football matches.

THE LANCET.

LONDON: SATURDAY, OCTOBER 13, 1928.

THE POSITION OF THE MENTAL DEFECTIVE.

"Existing institutions are full, and local authorities can no longer rely on charitable institutions or on the poor-law for this provision. Unless, therefore, they give immediate consideration to this matter the beneficent intention of the Mental Deficiency Act will be hampered and will almost cease to operate. We take this opportunity of making an urgent appeal for immediate action, and we do so the more confidently because every year reveals clearly the terrible consequences of the neglect to afford this means of protection."

"Unless a great effort is made in the immediate future to meet the constantly increasing demand for beds, it will become difficult and even impossible to administer the most important sections of the Mental Deficiency Act. . . . Once more this year we wish to impress on local authorities their responsibility for the degradation, crime, pauperism, and disease which must follow the neglect to provide suitable and sufficient accommodation."

THESE extracts are taken from the Board of Control reports of three years ago [1] and the present year [2] respectively. At the beginning of 1928 the institutions of the country dealt with 20,429 defectives. At the extremely moderate estimate of one in every thousand of population, the total number requiring institutional care is 39,067. Nearly twenty thousand persons, who could benefit by care and training if it were available, are committing crimes, begetting others feebleminded, drawing heavily on public money, cluttering up the workhouses, reformatories, prisons, and mental hospitals of the land and impeding the work of everyone in any way concerned with them. This calculation takes no account of the thousands more who do not require institutional care but only a certain measure of wise supervision. Ascertainment is speeding up, and the number of defectives of whom the local authorities have obtained knowledge has increased in the last six years from 25,470 to 61,522; most of these are in trouble of some kind. The local education authorities are reporting more defectives every year, mostly trainable children of 16 or under. Now the process of recognition is not within sight of being complete; some authorities have hardly even commenced it, yet the January returns show that 1479 defectives are "awaiting removal to an institution." When the work is performed properly, this number will be far greater. Even more serious is the position of those defectives who have remained, some for long periods, without training or proper classification, in the "places of safety" to which they have been committed under the Act until a petition for their removal to an institution could be presented; that of defectives remaining in prison; and that of those who, for want of proper accommodation, encumber the wards of mental hospitals. The waste of time and money which the presence of these persons entails on institutions quite unfitted to deal with them is incalculable.

The solution to the problem has been suggested in detail by the Board of Control again and again, and no one with claim to intimate knowledge doubts its validity. It is the provision by local authorities of farm colonies, of which there are many successful examples in the country. The reasons why it is not being put into practice are twofold. In the first place, while it would be foolish to deny that money is very short in probably every municipality in the kingdom, it is certain that the importance of the aim deserves a far greater expenditure than is at present allotted to it. But the failure of the local authorities to make the necessary provision is presumably, as the Board says, not entirely due to the shortage of money. In their experience it is sometimes due to a failure to realise the importance and gravity of the situation. The public see the necessity for treating florid mental illness; incipient mental disorder and mental deficiency escape their notice. They do not realise that mental deficiency is one of the most prolific sources, if not the most prolific, of practically every evil that besets the community. Perhaps the most conspicuous indication of the national blindness to its own vital interests in this matter is the tendency of magistrates and other responsible persons to allow, or even to encourage, the marriage of mental defectives. The Board publish a striking table, showing how six marriages in which one partner or both was defective produced 29 children, every one of whom became a source of anxiety and expense to relatives and State. The work of the voluntary bodies, especially that of the Central Association for Mental Welfare, is above praise, but these organisations cannot be expected to win the battle unaided. The time has come for new and stringent legislation, and for the establishment of a department of State to organise the provision of institutions throughout the country, giving financial assistance and advice to those authorities who require it, but also empowered to enforce the necessary steps, where they see fit, within a reasonable time. One of the most important and immediate of its duties would be an energetic educational campaign. It is, of course, not to be supposed that all or even a considerable number of local authorities are cynical, supine, or wilfully blind. They are for the most part composed of conscientious men and women who render much hard and ungrudging service to the community. A letter from the Chairman of the Flintshire County Council, which appeared in the *Times* for Oct. 9th, complains that two reasons have prevented his authority from taking action: (1) the Board of Control have been far too particular in approving of the accommodation which a local authority has proposed to find; and (2) the percentage of defectives who can be cured is very small, less than 5 per cent. The Board, he says, want all institutions to be of the superior, or curative, sort. The local authorities want to get accommodation for the incurable 95 per cent. at a reasonable cost, about £100 a bed, where the patients can be kept happy by ordinary sympathetic persons, and to transfer the few curables to a special institution. The writer seems to miss the point of the Board's requirements. The Board does not lay much stress on the possibility of curing defectives, but it wants to ensure the proper care, which, it holds, can only be institutional, of the forty thousand defectives who in any other environment are a danger and a disgrace to the community. The letter provides first-hand evidence that even enlightened local authorities do not appreciate the necessities of the position. It evinces, moreover, a strong distrust of the soundness of the Board's views. A central executive authority, by arranging for the full ventilation of the opinions of both sides, could greatly

[1] THE LANCET, 1925, ii., 655.

[2] The Fourteenth Annual Report of the Board of Control. Summarised on p. 773 of our present issue.

reduce friction of this kind and ensure the spread of that knowledge without which no local efforts, however conscientious, can be properly adapted to the necessity of the position.

THE SURGERY OF DEFORMITY: A SWING OF THE PENDULUM.

BEFORE the days of Lister, orthopædic surgeons confined their operations to those which were practicable by the subcutaneous method, and their successes were then largely attributable to patient gradual correction by means of apparatus, aided by subcutaneous sections of soft parts or bones. The introduction of the antiseptic and later of the aseptic method did away with most of the necessity for subcutaneous surgery and orthopædists were soon vieing with each other in devising and practising operative short-cuts to the correction of deformity. Their intention was to save much suffering and loss of time, likewise attaining more permanent results, and the pages of surgical journals in Europe and America during the last 50 years bear ample witness to the progress made. The surgery of muscles and tendons in relation to infantile paralysis has attracted a large share of their attention, and when Mr. NAUGHTON DUNN chose this subject for his presidential address to the Section of Orthopædics of the Royal Society of Medicine last week [1] he was able to raise some very lively issues. At the actual details of treatment for restoration of function he glanced but lightly, and the outstanding feature of his address was the conclusion that division of tendons or muscles is seldom necessary for correction of deformity. He did not intimate that this view represented a change of opinion in his own case, for as he said he was trained in a school in which gradual correction of deformity gave strikingly successful results. But it was otherwise with a number of speakers who took part in the discussion of the paper. One after another they arose and like converts at a revivalist meeting announced their conviction of sin, their repentance, and their determination to do better in future. With equal courage and candour they confessed that in the past they had operated unnecessarily or too often, and that they were determined in future to operate less frequently, in such conditions, for instance, as contraction of the hip. One speaker alone seems to have been faithful to the principle of immediate correction of deformity, standing fast in the advocacy of operation, and the remarkable conversion of his colleagues during the last few years perhaps justify him in wondering what their opinions may be when a few more years have passed.

The active orthopædic surgeons of to-day, some of whom only began to study the specialty during or even since the late war, have been accustomed to see open operations for nearly every deformity in which division of contracted and resistant structures seems to be needed. They have not perhaps realised that great success was achieved by their predecessors with older methods, and now that they have rediscovered the principles on which their professional grandfathers acted, they are (as it seems to us) in danger of allowing the pendulum to swing too far in a reactionary direction. This reaction goes beyond the limits set by subcutaneous surgery. It is not only a deprecation of open operations on bones, muscles, and tendons which was announced by the President and approved by most of the subsequent speakers, but an abnegation, in the treatment of most cases of contraction, of every kind of operation, except perhaps manipulation—and even this exception was not quite explicit. We are tempted to speculate on the causes of this striking change of theory and practice. It seems possible that there may lately have been a great decrease in the number of cases of severe post-paralytic contracture, since the attention of practitioners and Red Cross nurses has been drawn to deformities by the useful propaganda and teaching of the Central Committee for the Care of Cripples and the establishment of orthopædic clinics all about the country. As a result of this organisation and teaching, treatment is given in the early stages of deformity and contraction of a high grade is no longer allowed to develop. Is it not more than likely that cases of very severe deformity—say of the hip-joint, which was taken as typical in the discussion on Tuesday—which were not uncommon before the war, are now rare? If this supposition is correct it may well follow that it is not so much the orthopædic surgeon who has changed, as the usual type of contraction. If so, our anticipations of a return swing of the pendulum may not be fulfilled.

[1] For report see THE LANCET, Oct. 6th, p. 702.

SECURITY OF TENURE.

PUBLIC medical appointments carry a prospect of regular life, settled pay, and a pension at the age of retirement, which may compare favourably in the mind of the young medical graduate with the irregular life and uncertain income of the independent practitioner. A correspondent who has noticed the amount of space devoted to a description of these public services in our recent Students' Number would have us issue a word of warning to those who contemplate entering them that there is a snag. The aspirant should first of all find out what security of tenure is offered. In the large number of public appointments at present held under local authorities, even though there may be an obligation to contribute to a superannuation scheme, there is, writes our correspondent, no security of tenure whatever. Furthermore, the doctor in such public services places his professional reputation in the hands of an authority which is not obliged to give any reason for his sudden dismissal, and the dismissed medical officer has no legal redress, however his reputation may suffer thereby. In calling our attention thus to local authorities he has in mind not merely boards of guardians, councils of counties, county boroughs and towns, but their accredited agents, such as public health, watch and asylum visiting committees. Ever since the Local Government Act of 1834 the central authority has been shy of becoming involved in matters of local administration, and it is a fact, our correspondent states, that local authorities generally cover themselves from the risk of appeal to the Ministry of Health by the insertion of a three-months-notice-on-either-side clause in their approved standing orders.

It is, we agree, imperative for any medical man or woman entering a public service carefully to scrutinise the terms of any contract made, so that the medical officer may know exactly where he or she stands. In all such appointments there is presumably a contract of service, and this contract presumably contains provisions for the termination of the appointment on either side. But the tenure of certain public offices was placed on a more secure footing by the Public Health (Officers) Act of 1921, whereby it was enacted that the medical officer of health of a

local authority who, by the terms of his appointment, is restricted from engaging in private practice as a medical practitioner, should not be appointed for a limited period and should be removable by the authority only with the consent of the Ministry of Health or by the Minister and not otherwise. This provision, however, holds only for the actual head of the department and then only if some portion of his salary is paid out of moneys voted by Parliament or is chargeable to the Exchequer contribution account. Nor does the Act of 1921 apply to Scotland or Ireland. Further, it is provided by Clause 4 that nothing in this Act shall prevent a local authority from making, with the sanction of the Minister of Health, a temporary arrangement for the performance of all or any of the duties of a medical officer of health, and any person appointed by virtue of such arrangement to perform these duties or any of them shall, subject to the terms of his appointment, have all the powers and liabilities of a duly appointed medical officer of health. Poor-law district medical officers and medical officers of workhouses hold office, it is understood, until they die, or resign, or are proved to be insane, or become legally disqualified to hold such office, or are removed by the Minister of Health.

There are, however, a large and increasing number of medical officers in the service of public bodies who have not even the security of tenure provided in the Act of 1921. In many cases the conditions under which they hold appointment can only be discovered by reference to the advertisements inviting application or after specific inquiry. When the post in question is a whole-time one this complete lack of security may prove a serious matter, for a medical practitioner who has spent a large part of his life in a post of this kind may find it difficult to make a fresh start. When the post is a part-time one its loss is not so serious. Security of tenure concerns not only the officer himself but also the public welfare, for in cases where a medical officer in the discharge of his duties is likely by his action to affect the interests of members of the public body whose medical officer he is, it is obviously contrary to the public weal that he should have any ground to fear dismissal for the efficient discharge of his duties. Police surgeons are liable to supersession by the watch committees of their district, and there have been instances in which the surgeons appear to have lost their posts as a result of giving evidence which did not support the contentions of the police. Among the numerous medical posts now held under public bodies are those in mental hospitals and public sanatoriums, where the interests of the governing bodies are not so likely to conflict with the proper discharge of their duties by the medical officers, but in which insecurity of tenure renders them more liable to injury arising out of jealousy or intrigue on the part of fellow officers. In accepting appointments under public bodies, therefore, careful attention should be given not merely to the amount of salary offered, but to the position as regards pension or superannuation. It is prudent to be aware of such curious anomalies as that affecting poor-law medical officers, according to which the guardians may, if they wish, make an allowance to a medical officer dismissed for misconduct, but not to a medical officer who voluntarily resigns—a state of affairs which involves hardship where a medical officer leaves a neighbourhood for the sake of his wife's health or some similar reason. Information on these various heads is not easy to come by, and although the medical defence societies keep these matters constantly in view, and no doubt instances of summary dismissal are likely to come to their immediate notice, there are many implications of insecurity of tenure which are not amenable to rules of conduct and yet are liable to affect the comfort and happiness of the public medical officer.

Annotations.

"Ne quid nimis."

THE MÉDECIN-CHEF.

THE entertaining address by Dr. Walter Carr, which we publish on p. 753, is largely a plea that our profession should no longer seek the sceptre and the glittering prize, but rather gain the satisfaction that comes from doing small things efficiently. The chief seats at the feast, he seems to think, are no place for the medical man; and he will doubtless be glad to read our American correspondent's report that every student at the Johns Hopkins Hospital is now obliged to take a course in cookery in the hope of making him fit for a less ornamental rôle. Nor is this addition to the medical course without enthusiastic champions in Europe, for the question was raised only a few weeks ago by a writer in the French medical press.[1] Lack of knowledge of the culinary arts, he said, is a serious defect in a physician's training. The importance of cooking in relation to the nutritive value of food has been proved again and again, but this knowledge is very little applied. If a patient himself is ignorant and if his doctor is unable to advise him, his "cure" or otherwise will often rest in the hands of some ignorant woman whose notions are borrowed from the fried-fish shop. Yet all one needs, declares this engaging Frenchman, is to apply the basic principles of chemistry and physics to food and its preparation. The result is a new science which he terms "gastro-technics," and which he summarises for the use of doctors under six headings—boiling, frying, roasting, steaming, mixing with starch, and mixing with yolk of egg. If these six principles, which he explains in detail, are fully understood, all the rest is perfectly simple. It may take an Escoffier ten years to learn how to cook a sole meunière worthy of the name, but a doctor is a scientist whose training should enable him to seize the fine points of the art in no time. Here, then, is an opportunity for those who are burned by Dr. Carr's satirical criticisms and long to show their competence in really useful spheres. The task is evidently easy, and the necessity for undertaking it is unassailable. The physician who neglects his duties as a dietitian is not a good physician. No one can be a good dietitian if he knows nothing of cooking. And from this it undoubtedly follows that the lack of good cooks in our profession must be regarded as another standing reproach against the General Medical Council.

HEALTH OF THE R.A.F.

THE Report on the Health of the Royal Air Force for 1927 [2] records a satisfactory advance in sanitation and the handling of tropical diseases. It also includes the new and judicious programmes for the education of medical officers upon their appointment, and for the training of laboratory assistants, so that they may be worthy of similar employment in civil life when their time expires. All flying officers, it is pointed out, must pass in hygiene before promotion to the rank of squadron-leader, and all drafts (officers and other ranks), before proceeding abroad, are shown health appliances in the newly formed hygienic museum at Uxbridge; these demonstrations arouse great interest, and voluntary visitors to the museum are numerous. The total force was 30,123 (including 3302 officers), and illness has on the whole been

[1] Presse Médicale, March 17th, p. 349; Aug. 22nd, p. 1067.
[2] H.M. Stationery Office. 1928. Pp. 86, 4 plates. 3s.

reduced. Influenza increased, but preventive inoculations appear to have given encouraging results. A scarlet fever epidemic was extinguished with the aid of a "bed spot" map, and a threatened diphtheria outbreak was suppressed after Schick-testing and immunisation. The total death-rate was 4·2 per 1000 (1·5 from disease, 2·7 from injury). From duty flying there were 52 deaths (78 in 1926), and 81 other casualties (101 in 1926). The casualties from flying were the lowest for four years, and the lowest ever recorded in relation to the number of aircraft hours flown. There were 81 deaths from accident, and 45 from disease, tubercle accounting for 9 (7 pulmonary), pneumonia 7, typhoid 4, appendicitis 3, and malaria 3. The number of invalidings was 185, of which 28 were attributed to psychoneurosis, 23 to tubercle (21 pulmonary), and 21 to accidents. Of the men with tubercle, only 7 had seen less than four years' service, the prevalence rates by age for the Force being: under 20, 0·4; under 30, 0·1; under 40, 1·6; over 40, 8·0 per 1000. Comparison with the other services would be easier if ages were grouped in the 5-year periods of the Registrar-General. Of the total injuries a third are put down to athletics, the most common and serious damage being synovitis of the knee. The report contains an account of the principles of the medical examination of pilots, and it is claimed that the success of Imperial Airways (2,400,000 miles flown and 54,000 passengers carried without serious accident in three years) proves the soundness of the medical selection of the pilots, which is carried out by the Air Force Central Medical Board. Many other interesting facts and figures are recorded, and the Medical Director's department is to be congratulated on bringing out the report within nine months of the end of the period to which it refers. This is a distinct advance on previous years, and we hope that the acceleration will be maintained.

THE ANTI-HÆMOLYTIC POWERS OF LIVER.

ALTHOUGH the efficacy of liver and its extracts in raising the red cell count in pernicious anæmia is universally admitted, the reason why they do so remains as much a mystery as ever. M. Weinberg and J. Alexa,[1] of Paris, offer as an explanation the anti-hæmolytic power of liver extracts. Adopting the view that the abnormal blood destruction, which is one of the characteristic features of pernicious anæmia, is due to the action of hæmolysins, probably bacterial in origin, they tested the power of aqueous extracts of liver to inhibit the action of these blood-destroying agents. As *Bacillus welchii* has for many years been accredited with some causative rôle in pernicious anæmia, and as this organism provides a powerful and easily prepared hæmolysin, they used *welchii* toxin for most of their experiments, and they found that admixture of liver extract with the toxin inhibited its hæmolytic action both in vivo and in vitro. In vitro they found that 0·1 c.cm. of an aqueous extract of liver was sufficient to prevent the hæmolysis of 3·5 c.cm. of a 5 per cent. suspension of red cells by 0·1 c.cm. of the toxin, an amount which, in the absence of the extract, caused rapid and complete destruction of the red cells; in vivo they found that admixture of an equal bulk of liver extract with a lethal dose of toxin never failed to prevent the hæmolysis which always appeared in control animals. Similar results were obtained with hæmolysins prepared from *B. coli*, staphylococci, and the *vibrion septique*. In view of these results Weinberg and Alexa suggest that a trial should be made of the effect of washing out the bowel of pernicious anæmia patients with liver extract. But as there is ample evidence that good results can be got by applying liver extracts to the intestinal canal from above downwards, it seems doubtful whether such retrogressive therapy will ever find much favour.

[1] Compt. rend. de la Soc. de Biol., 1928, xcix., 25, 507.

"THE NEW COAL AGE."

So much has been said of recent years on the advantages of low temperature carbonisation that we welcome the appearance of a journal devoted entirely to this subject, the policy of which is stated to be summed up in the phrase "Scientific fuel is the fuel of the future." The journal announces that it will represent no party, no group, and no financial interest, and that its pages will be open to explain, describe, and discuss all processes and all forms of scientific treatment of coal. If this policy is adhered to it should fill a long-felt want. The development and increasing use of low temperature coke must have a profound effect upon the health of the people, since in this way an immediate reduction of the smoke pollution of the air of our cities might be made. The treatment of coal by low temperature carbonisation provides not only a solid smokeless domestic and industrial fuel, which can be used in the powdered form, but also is a source of oil for fuel and lubricating, motor spirit, fertilisers, and acids. In addition, a rich gas is produced during the process; indeed the disposal of this rich gas has been one of the problems confronting the makers of low temperature coke in the past, the difficulty being not so much technical as one of conflicting commercial interests. Finally, it is within the bounds of possibility that the development of low temperature carbonisation may give a new lease of life to the coal industry.

TREATMENT OF PNEUMONIA WITH CONCENTRATED POLYVALENT SERUM.

ATTEMPTS to produce a powerful specific remedy against lobar pneumonia have not been of much practical value, as it has only proved possible to make a serum for use against infections by pneumococci of type 1, and this in such low concentration that effective dosage is difficult. Even when the technical obstacles of administration have been surmounted the beneficial effects have not been altogether convincing, and the more interest therefore attaches to a paper[1] in which Dr. R. L. Cecil recently communicated to the Massachusetts Medical Society the good results he has had at Bellevue Hospital with what is known as Felton's serum. First made by Dr. Lloyd Felton about three years ago, this is a polyvalent product prepared by immunising horses against pneumococci of types 1, 2, and 3. The serum is taken from the animals in the usual way, but by precipitating the immune bodies with distilled water and then redissolving them in a concentrated form, it is claimed that the final solution can be made 10 to 20 times as strong as the original serum. The amount of foreign protein in it is also said to be much less than in the equivalent amount of ordinary serum and the so-called anaphylactic reactions of the patient are correspondingly less common. The serum has now been standardised, the unit being the amount that will protect a mouse against a million fatal doses of pneumococcal culture. The relative potency of the serum against the various types is shown by the fact that a given dose will contain on an average 2000 units against type 1, 2000 against type 2, and 200–400 units against type 3.

In the clinical test at the Bellevue Hospital the following method was adopted. As soon as the diagnosis of lobar pneumonia had been made the cases were numbered and serum was given to those with even numbers, the remainder being given exactly similar treatment in every other respect. The patients thus selected by chance then had intradermal and ophthalmic tests for supersensitiveness to horse serum, after which 80–100 c.cm. of Felton's serum was given intravenously. Dosage on the following days depended on the condition of the patient but was usually much smaller, 25 c.cm. being an average quantity given. Serum sickness was noted in 12 per cent. of patients and seemed to depend chiefly on the amount injected. Dr. Cecil

[1] New England Jour. of Med., Aug. 30th, p. 415.

explained the mode of action of the serum by saying that it contains agglutinins, precipitins, and opsonins, which increase phagocytosis and help to establish a balance of immune bodies in the blood, thus discouraging the circulation of bacteria. In the ordinary untreated case, he believes, immune bodies and pneumococci do not occur in the blood together; it is only at the crisis, when the organisms disappear, that the immune bodies manifest themselves. He considers that Felton's serum in pneumonia of types 1 and 2 causes an immediate and progressive rise in the amount of immune body circulating, with a corresponding sterilisation of the blood. The treatment was given in 414 cases with a control series of 407, and the results were as follows: Of the treated cases, the numbers attributed to the four types (1–4) were respectively 144, 107, 32, and 131, with a percentage mortality of 18, 39, 37, and 30. For the untreated cases the figures were 132, 95, 52, and 128, with a mortality of 32, 52, 27, and 40 per cent. In the case of type 1 infection in which serum was given during the first three days of the disease, the mortality was only 11 per cent.

These figures suggest that Felton's serum is of most value in type 1 infections, of less value in type 2, and of no value in type 3. The fact that in this last group the mortality was 10 per cent. higher in the treated cases than in the untreated, shows the need for caution in drawing conclusions from the apparent improvement in the other groups, but Dr. Cecil is evidently satisfied that the serum is useful, for he says that in it "we have a potent product, a polyvalent product; we have a stable product, we have a practical product, something that is easy to administer and which does not give severe reactions. We hope to have within the next year a polyvalent type 4 serum which we can use in type 4 pneumonia and thus have a specific agent for three out of the four forms of lobar pneumonia." In the subsequent discussion Dr. F. T. Lord pointed out that there was good reason to believe that the mortality of type 1 pneumonia could be reduced if antiserum was given in the first three days of the disease. Nearly everyone agreed that it was unjustifiable to treat every pneumonia patient with unrefined type 1 pneumococci as soon as his condition was clinically diagnosed, for this meant that two-thirds of them would be liable to troublesome reactions without any possibility of benefit. Felton's antibody, however, was more potent, was polyvalent, and was less likely to cause reactions. A dose of 5–10 c.cm. intravenously obviated the necessity of complicated apparatus, and its administration before the type of pneumococcal infection was determined saved at least 24–48 hours—a precious interval in pneumonia. It was useful not only in type 1 but probably also in type 2 pneumonia, and he believed that with due precautions there need be no hesitation in giving it to patients who were not hypersensitive to horse serum.

MALARIA IN CANTONMENTS.

THE Malaria Commission of the League of Nations, whose findings we summarised on Sept. 29th (p. 664), has pointed out that antimalarial methods are many and their applicability so various that an immense amount depends on the selection of a shrewd superintending officer. This view finds warm support in an article on The Cantonment Malaria Problem, by Major T. O. Thompson, in the September number of the *Journal* of the Royal Army Medical Corps. He points out that it is not much good destroying anopheles in the cantonment while a privately owned neglected bit of land on the boundary is left to harbour myriads, that reclamation need not always be very expensive, and that quite well-educated people may escape antimalaria instruction and be surprised to find that mosquitoes are breeding round their own bungalows. He notes that it is difficult for the "antimalaria officer" to trace out in detail the life-history of the various local species of mosquito if he is constantly being deplaced to relieve a sick brother officer in a neighbouring station or to accompany a unit for a couple of weeks on a march; he also observes that it is harder to enforce the proper use of mosquito nets in units whose medical officers themselves notoriously neglect the precautions ordered. His greatest hope is in the mosquito-proofing of buildings, although methods highly commended in one place are not always just as successful when tried elsewhere. He recommends that a spot-map be made of all the beds in a unit with the malaria cases marked as they occur, so that local mosquito-breeding may perhaps become conspicuous, and he advises that particular attention be paid to the man on detached or special duty, who is apt to get into mischief for want of official supervision.

THE MEDICAL BASIS OF RITUAL.

SCIENTIFIC administrators have often tried too conscientiously to impose by force upon a people of Eastern or primitive mind a rational law of hygiene. It is of the utmost importance for public health that the tenets to be observed should be expressed "in the vulgar tongue" and based on the natural ways of thought of the people concerned. Western hygienists are apt to think that sanitary science is a product of modern pathology, whereas, in fact, it is universal. Dr. A. N. Chatterjee illustrates this truth in an article [1] showing that the religious enactments of ancient India contain as effective a sanitary code as the book of Leviticus. The priest or prohit was the medical officer of health, and his success in controlling epidemic disease, in disposing of sewage, and ensuring a pure water-supply was surprising. According to the instructions excreta were always to be passed into a hole six inches deep and covered with grass and earth; houses were to be swept daily and special ceremonies called for elaborate periodical "spring-cleaning" of every nook and cranny. Decaying vegetable matter was believed to breed insects and had to be cleared out of dwellings and burnt. A set of rules for every man included daily bathing in pure water and care of the teeth and bowels. Since all food had to be offered to the gods before it was eaten, and since unclean and infected food could not be offered up, the purity of the people's food was assured. In the same way the water-supply was deified and any pollution of the rivers became grave sin. A dead body was regarded as infectious, and the bodies of those who died of dysentery, consumption, small-pox, and other similar diseases required special purification before cremation. This involved burning to ashes all the clothing and bedding with which the patient had been in contact and imposing a quarantine period on the bearers—i.e., usually the relatives who had nursed the patient. House disinfection was enjoined after any illness; pots, pans, and garments were washed with ash, earth, and water, and blankets with powdered soap-nut and white mustard; cooking vessels were boiled and floors scraped; cotton fabrics were washed and hung in the sunshine. Dr. Chatterjee says that for the most part diseases were ascribed to living creatures, mostly invisible. Some liked meat and others preferred sugar; some lived in vacant and dirty houses and others on the earth. They grew in large numbers in dirty unplastered dwellings, in exposed excreta, on public roads, on battlefields, and in places of pilgrimage. When people did not observe the laws of hygiene and sanitation these animals attacked them. But for the trifling difference that these were called "pishaches" instead of bacteria there is little contrast between the old and the new. When an epidemic threatened, the wise men introduced a particular form of worship to meet the case. For a people who understand ritual better than logic it is far more effective to declare that a patient has become the dwelling-place of a goddess and must therefore be respectfully isolated, than to impose the routine of a European fever hospital for no reason that the relatives and friends can understand. The Sitala

[1] Patna Journal of Medicine, 1928, iii., 167.

Puja, or ritual of the goddess of small-pox, excluded visitors, prohibited the sale of milk, forbade members of the family to attend public functions, and ordained a fire of resin, camphor, and sandalwood at the door of the patient's room. Vaccination of contacts would be a small and inconsiderable addition if introduced as part of the religious obligation.

GOITRE IN NEW ZEALAND.

SIMPLE goitre is well known to be prevalent in New Zealand, and toxic goitre occurs sufficiently often to present a difficult problem. During the past few years we have had occasion to notice several articles on the ætiology and prevention of goitre emanating from the medical school of the University of Otago; five of these have now been collected in a "Goitre Number" of the *Proceedings* of this Medical School,[1] under the editorship of Prof. D. W. Carmalt-Jones. Most of the work done has been concerned with simple goitre. There are at least half a dozen theories current purporting to account for the occurrence of endemic goitre: fæcal contamination of water, radio-activity of water, salts dissolved in drinking water, general diet, geological formation, and iodine deficiency in diet. The last of these, and in a special sense the geological formation, appear to be the essential causes of the endemic goitre in New Zealand. This is well brought out in an exhaustive survey by Prof. C. E. Hercus, Prof. W. N. Benson, and Mr. C. L. Carter, who, as bacteriologist, geologist, and chemist respectively, studied goitre in the whole country. The percentage of goitre among school-children was taken as a basis, and these authors divided the Dominion into 33 districts, each as far as possible homogeneous in its geological and physiographical circumstances. The average amount of iodine in the soil and the average incidence of goitre among school-children within each district were then ascertained, standard methods of soil-analysis and diagnosis of goitre being applied. Roughly the incidence of the disease was found to be inversely proportional to the amount of iodine in the soil and an actual formula of the relationship could be defined: "percentage of incidence of goitre among school-children is equal to 6 plus the quotient of 360 divided by the amount of iodine in ten million parts of soil, so long as this does not exceed 50." The conclusion reached is that "though there are certain points unexplained, the whole body of facts is too large, and the relationship too consistent, to be fortuitous."

This work on the ætiology of the disease is separated from a discussion on prophylactic measures by an informative paper by C. E. Hercus and K. C. Roberts on the iodine content of certain foodstuffs. Here some important results are recorded. It is shown that soil-iodine is accurately reflected in food-iodine, that there is a definite difference in the daily iodine intake in the food-supply of typical goitrous and non-goitrous districts, that commercial salt is an unreliable source of iodine-supply, and that the iodine content of human milk in the goitrous woman is lower than in the non-goitrous. These facts having been established, prevention still remains fraught with difficulties. According to Prof. Hercus the greatest of these is the danger which attends the indiscriminate use of iodine in a community containing a large number of people with potentially toxic goitres. The problem is to supply the iodine deficiency in a universal, simple, and harmless manner. This could be done by increasing the use of foods rich in iodine or, since the initial deficiency lies in the soil, by using iodine-rich manures. In practice, however, there are objections to both these methods, and the two measures in vogue consist in giving iodine in medicinal form to school-children and in adding iodine to some article of diet in universal use throughout the country. Extensive medicinal treatment of school-children has given highly satisfactory results in New Zealand with no untoward effects, but this method of prophylaxis is too limited in scope to be acceptable as a national scheme. The preparation of iodised salt has therefore come to be regarded as the method of choice. In 1924 the Department of Health introduced into the Food and Drugs Act a definition which stipulates that iodised salt must contain one part of potassium iodide in 250,000 parts of salt. The use of this salt, however, is as yet largely confined to the table, and Prof. Hercus is in favour of the compulsory iodising of all cooking and table salt introduced into the country. The minimum amount for the functional requirements of the thyroid gland appears to be 0·005 mg. of iodine per day, and this quantity is considered to be far too small to be a factor in the production of hyperthyroidism. The amount of salt consumed either in cooked foods or directly as a condiment varies so greatly with individual or skilled taste that it may be found difficult in practice to ensure that each person gets enough and not too much extra iodine. But in a country where about one child out of every three has a goitre, it is probably worth giving this convenient form of universal administration a prolonged trial.

[1] No. 5. 1928. Published by Budget, Ltd., Dunedin, N.Z.

PRESERVATIVES IN FOOD.

THE use of boric acid in food was the subject of an address delivered before the Edinburgh Rotary Club a few days ago by Dr. Andrew Rutherford, lecturer in pathology at the Edinburgh Medical School. The public mind had, he said, been made anxious by accounts in the press of illness arising from alleged food poisoning, coupled with the suggestion made by a distinguished chemist that the prohibition of boric acid as a food preservative had brought a definite risk to the community "because it limits the period during which food can be kept free from contamination." But, said Dr. Rutherford, attacks of food poisoning had not been more frequent of late than in former years; actually fewer outbreaks had occurred this year than previously, and none at all in Scotland—they had merely received more press publicity. The causes of food poisoning had been known for many years; they were specific disease-producing germs which become implanted in food, stale or fresh. The illnesses they brought about were neither new nor mysterious to pathologists or to the medical advisers of the Government. They had nothing whatsoever to do with the presence or absence of weak chemicals like boric acid as preservatives in food; no chemist, however distinguished, could competently express an opinion on the broad question of food preservatives in relation to disease. That was the domain of physicians, pathologists, and public health experts. Ptomaine poisoning in man, Dr. Rutherford reminded his hearers, was in fact exceedingly rare; the vast majority of cases of food poisoning were due to living specific microbes which in various ways might become implanted on food or drink. Small quantities of boric acid would neither prevent the access of those germs nor kill them if they were present. Food such as sausages and pork pies, containing preservatives, had often been associated with acute gastro-enteritis. A preservative might keep food looking fresh and smelling fresh when dangerous microbes were growing in it. Certainly boric acid would keep it, in the popular phrase, "free from taint," but in doing so might mask a far greater danger than mere taint. Generally speaking, food was handled in this country with far too little regard to the possibilities of contamination, and much stricter cleanliness than obtained at present was desirable in the handling, storage, and cooking of food. The recent regulations dealing with preservatives tended to lessen and not to increase food poisoning outbreaks. The Meat Inspection Regulations and the Milk and Dairies Acts—irksome as they might be at times to traders—served a similar purpose. Wherever food was kept or cooked the utmost efforts should be made to prevent the access of flies, mice, or rats. Milk should be pasteurised and cold storage provided. Employees who handled or cooked food in large concerns like bakeries, hotels, restaurants, and clubs, should be proved not to be carriers of the typhoid or food-poisoning germs before

they were taken on. It was, concluded Dr. Rutherford, almost monstrous to insinuate, as had been done widely in some sections of the press, that the Ministry of Health had done wrong in putting a stop to the doctoring of food by chemicals.

THE HARVEY FILM.

THE film, showing the series of experiments carried out by Harvey in formulating his proof of the circulation of the blood, which was prepared by Dr. H. H. Dale and Sir Thomas Lewis for the Royal College of Physicians of London and was exhibited at the Harvey tercentenary celebration last May, will be shown by permission of the Royal Society of Medicine in their Barnes Hall, on Tuesday, Oct. 30th, at 5 P.M. In compliance with the injunction of the Home Office that the film should be shown only to scientific audiences, admission will be limited to medical practitioners and students of medicine, who may obtain tickets, bearing their own names and not transferable, by calling personally either in the Issue Room of the Library of the Royal Society of Medicine (1, Wimpole-street, W.), or in the Office of the Royal College of Physicians in Pall Mall East. As the seating accommodation is limited early application is advised.

FROM SPA TO SPA.

MEDICAL delegates from many countries reached London early in the week for this year's meeting of the International Society of Medical Hydrology, and the proceedings opened auspiciously on Tuesday night with a reception at the Royal Society of Medicine, attended by more than 200 guests. Six years have passed since the Society's foundation, and in this time much has been done to draw together workers all over the world who are especially interested in treatment by physical methods and natural waters. The number of patients, both here and abroad, who seek relief at spas shows the importance of this branch of medicine, and the Society's journal, the *Archives of Medical Hydrology*, has consistently encouraged a scientific outlook and a more frank exchange of views among those who practise the specialty. Of late the claims of chronic rheumatism have received a large share of public attention, and the Society has played no small part in arousing this active interest. It was natural, therefore, that the President, Lord Dawson, in his opening speech on Tuesday, should dwell on the facilities for treating rheumatism at the spas, at the same time emphasising the necessity for establishing clinics for teaching the disease in the large industrial centres beside the homes of those who cannot leave their work. At their meeting on Wednesday morning the members considered the allied question of the relation of the spas to the State and to National Health Insurance, and the subject of rheumatism again appears on the agenda for the meetings to be held at Harrogate and Buxton over the week-end. The Society has formerly held its annual conferences abroad, and so large a gathering of foreign spa physicians at the British health resorts is certainly unprecedented. This makes it the more desirable that the promise of the programme shall be fulfilled and that this meeting shall be a source of pleasure and profit to all concerned.

MERCURIC IODIDE AS A GERMICIDE.

A SOLUTION of mercuric iodide in watery potassium iodide has been widely used as a disinfectant, as it lacks the corrosive action on instruments and tissues that "perchloride" unfortunately exerts. But Dr. H. Candy and Prof. W. Bulloch have now found that the faith placed in this method of disinfection is unjustified.[1] Steam-washed catgut ribbons were immersed in a 1/1000 solution of mercuric iodide for 1710 days and were still infected at the end of that time. Silk threads retained bacterial spores after 666 days at room temperature in a 1 per cent. solution in ethylic alcohol. Chemical experiments to ascertain the part played by mercuric iodide in tissue showed pretty conclusively that the molecular unity remains unimpaired, and has an unsuspected stability. The search for the ideal disinfectant continues unabated; meanwhile it seems that biniodide of mercury must follow several other hopeful competitors to the scrap-heap.

[1] Brit. Jour. Exper. Path., 1928, ix., 179.

WELSH NATIONAL MEDICAL SCHOOL.

THE dispute between the authorities of this School and the Cardiff Royal Infirmary, where the students have hitherto done their clinical work, appears to be reaching a climax. Public opinion in South Wales is crystallising on the side of the authorities of the medical school, whose efforts to provide adequate instruction for students in their final years have been nullified by the refusal of certain members of the staff to coöperate. Lord Aberdare, who has been the treasurer of the hospital for several years and a most generous subscriber to its funds, has resigned this post, giving the following reason: "The recent decision of the Council not to coöperate with the medical school is so contrary to all I expected of them that I feel bound to take this step." He has refused to reconsider his resignation and has suggested that the matter in dispute should be referred to Sir John Eldon Bankes. At a meeting of the Cardiff City Council held on Oct. 8th Alderman H. M. Thompson asked the chairman of the Finance Committee when the committee were going to recommend to the City Council the withdrawal of the £2000 subscription granted to the Cardiff Royal Infirmary, in view of the action of the executive body of that institution in arbitrarily withdrawing facilities necessary for the medical education of Welsh students. It seems probable that the embarrassments of this unfortunate school may shortly be relieved.

AT the opening meeting of the Medical Society of London it was announced by the hon. treasurer that the famous John Ward Diary had been sold for £10,000. Of this sum £9000, he said, had been invested, the remaining £1000 going to the improvement of the Library.

THE fourteenth annual conference of the National Association for the Prevention of Tuberculosis will be held on Monday and Tuesday next, Oct. 15th and 16th, in the Great Hall of the B.M.A. House, Tavistock-square, London. Sir Arthur Stanley, as Chairman of the Council, will formally open the conference at 10 A.M. on Monday, when Dr. R. C. Ferguson, of Saskatchewan, will introduce the subject of the occurrence of tuberculosis among primitive peoples. He will be followed by Colonel J. J. Vassal, M.D., ex-director of health of French Equatorial Africa, and by Prof. S. Lyle Cummins, principal medical officer of the Welsh National Memorial Association. On Tuesday Sir Robert Philip will introduce the second subject, being the principles underlying a scheme of anti-tuberculosis measures in any country. He will be followed by Dr. Howard Holbrook, of Hamilton, Canada, and Dr. G. Lissant Cox, central tuberculosis officer for Lancashire. The discussion will be continued on the afternoon of each day.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—On Nov. 9th Dr. J. A. Ryle will address this society on Some Symptoms and Consequences of Arterial Disease, and on Dec. 14th Sir G. Lenthal Cheatle will give the Purvis Oration, entitled Certain Matters Concerning Tumours. Fixtures for next year are a clinical evening (Jan. 11th) and addresses by Mr. H. P. Winsbury White on Chronic Infection of the Urinary Tract (Feb. 8th), by Dr. James Neal on Some of the Medico-legal Difficulties of General Practice (March 8th), and by Dr. J. R. Wylie on Diagnostic Problems within the Chest and Abdomen where X Rays may be of Use (April 12th). The President's address will be given on May 10th.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

VII.—THE INTERPRETATION OF REPORTS ON THE CEREBRO-SPINAL FLUID.

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II. THE PATHOLOGIST'S RESULTS.*

A COMPLETE report on a normal specimen of cerebro-spinal fluid is shown in the second column of the table. Such a report would exclude certain acute diseases, such as general paralysis, meningeal syphilis, and all forms of meningitis. It would not, however, exclude tabes, in which the fluid is normal in 10 to 15 per cent. of all cases, nor cerebral vascular disease, whether due to syphilis or atheroma. Nor would it exclude cerebral tumour, although it would almost certainly exclude spinal tumour. It would still admit of such diagnoses as disseminated sclerosis, encephalitis lethargica, or even poliomyelitis, although some abnormality, such as excess of cells, is usually encountered in these diseases. In certain forms of paraplegia—as, for example, subacute combined degeneration, amyotrophic lateral sclerosis, and syringomyelia—the cerebro-spinal fluid is usually completely normal. Many progressive nervous diseases may thus still be present in spite of a "normal" report, and unless this is realised the physician may often be disappointed by the lack of help which the examination gives.

Wassermann, Sigma, Meinicke, and Kahn Tests.

Considering this report in more detail we may take first the most specific of the tests, the Wassermann reaction. We are accustomed to accept a positive Wassermann reaction as proof positive of syphilis, and this assumption has much justification; but there are one or two possible sources of error. The most frequent of these are false positives given by certain cerebro-spinal fluids which contain an excess of protein and which tend to coagulate during the test. To guard against this possibility, it is wise to inactivate the fluid by heating it at 56° C. for 20 minutes, as is done with blood serum. This does not, in my experience, weaken a true positive reaction, and it is absolutely necessary if the strength of the reaction in the cerebro-spinal fluid is to be compared with that in the blood. In my opinion, a positive reaction given by an unheated cerebro-spinal fluid is very untrustworthy. This point is of the great importance since, especially in tabes dorsalis, a positive Wassermann reaction may be the only abnormality in the fluid, and this may be associated with a negative blood Wassermann. In a series of 530 cases of tabes examined at the National Hospital, Queen-square, during the past nine years, I have found the cerebro-spinal fluid normal except for a positive Wassermann reaction 33 times. In 28 of these the blood Wassermann was also positive, in the other 5 negative. A negative Wassermann reaction in the cerebro-spinal fluid is of more doubtful meaning. It is well known that in about 20 per cent. of all cases of tabes, and in about half of the cases of syphilitic hemiplegia, the fluid Wassermann is negative. It is rare to find in tabes a negative Wassermann in association with an increase of cells and protein, but this sometimes occurs in cases in which the blood Wassermann is negative. On the other hand, the fluid Wassermann may be strongly positive when the blood Wassermann is negative. This combination is fairly common in tabes, and not unknown in general paralysis; but it practically never occurs except in these two diseases.

The *effect of treatment* on the Wassermann reaction of the cerebro-spinal fluid is very different in general paralysis (G.P.I.) and tabes, from what it is in secondary and tertiary meningeal syphilis. For whereas in the latter conditions a course of treatment of ordinary intensity for a period of two or three months usually suffices to render the fluid completely negative (however little it may affect the blood Wassermann) it has little if any effect on the reaction of the fluid in tabes and G.P.I. It may reduce the cell count, though rarely to normal figures, but the globulin, Lange, and Wassermann reactions remain practically untouched. So constant is this immobility of the fluid changes in G.P.I. that it forms one of the most valuable criteria in the differential diagnosis between this disease and cerebral syphilis of the meningo-vascular type. Malarial treatment, even when most successful in producing clinical improvement, does little to alter this law. Gradually, if improvement is maintained, the changes in the fluid recede, but for many months after the patient has returned to work, the Wassermann reaction in his cerebro-spinal fluid remains positive. Usually this reaction recedes pari passu with the Wassermann reaction in the blood or if anything more slowly, so that at one period the fluid Wassermann reaction may be positive and the blood Wassermann reaction negative. In tabes also the Wassermann reaction usually recedes as slowly in the fluid as in the blood, but both are less resistant to treatment than they are in G.P.I. In purely meningo-vascular syphilis, on the other hand, the Wassermann reaction in the fluid always disappears long before that in the blood, and in the meningitis of the secondary period treatment often banishes the Wassermann reaction in the fluid with the greatest rapidity.

Of the other reactions for the diagnosis of syphilis which depend on a precipitin or agglutination reaction similar to that in the Widal reaction, the most generally used are the Sigma, the Kahn, and the Meinicke. It is too early yet to be dogmatic as to their value when applied to the cerebro-spinal fluid. Even the Kahn reaction, in which the reacting substance in the cerebro-spinal fluid is concentrated ten times for the test, appears to be less sensitive than the Wassermann reaction. It must be remembered that in the Wassermann reaction ten times as much cerebro-spinal fluid is used as blood serum, and, therefore, a result which is reported as of equivalent strength in blood and cerebro-spinal fluid (say + ± in each), is only one-tenth as strong in cerebro-spinal fluid as in blood. In the precipitin tests, as in the Widal reaction, the dilution of the reacting substance is of more importance than the total quantity present. Consequently unless the cerebro-spinal fluid is concentrated by some such method as that used by Kahn, the results given will be much too weak.

Colloidal Reactions.

As regards the less specific colloidal reactions (gold, benzoin, paraffin, or mastic) we are on less certain ground. Of these reactions the Lange's colloidal gold is among the most used. While normal fluid causes no alteration in a colloidal gold solution, precipitation of the gold may occur with cerebro-spinal fluid from cases of (1) G.P.I., (2) syphilis of the central nervous system, (3) meningitis. It is convenient for the differential diagnosis of these conditions that the precipitation occurs in different dilutions, though these overlap to some extent. The dilutions of fluid used in the test are usually 10 in number, varying from 1/10 to 1/5120. The result of the test in each of the 10 test-tubes is usually stated in figures from 0 to 5, 0 denoting no precipitation, and 5 denoting complete precipitation, intermediate changes shown by alterations in the colour of the gold-sol from red to blue being indicated by the figures 1–4. Therefore a report of 0011100000, which would be the reading of a normal C.S.F., indicates that there was no precipitation in most of the dilutions, but a very slight one in the dilutions 1/40, 1/80, and 1/160.

G.P.I.—The result of the colloidal gold test in typical cases of G.P.I. is said to be *the paretic response.*

* Part I.—The Practitioner's Results—appeared last week.

Precipitation occurs in the eight strongest dilutions, diminishing gradually. A typical response expressed in the general form would be 5555443200.

Cerebro-spinal syphilis and tabes.—The precipitation here occurs in higher dilutions, a typical *luetic* response being 0014320000.

Meningitis.—The so-called *meningitic response* is less reliable as a guide to diagnosis. The precipitation first occurs at the dilution of 1 in 160 or thereabouts, and is at its maximum at the dilution of 1 in 640. A typical response would be 0000244330.

It is probably true that a strong reaction is obtained in every case of general paralysis, and in every case of acute and progressive meningeal syphilis. But negative or weak reactions do not negative the diagnosis of tabes or of meningo-vascular syphilis of less acute form. On the other hand, strong reactions of the "paretic" or "luetic" type, when associated with a negative Wassermann reaction, must be taken as evidence against rather than for the diagnosis of syphilis. This last statement must be modified for cases which have undergone antisyphilitic treatment, as in them the colloidal reactions may remain positive after the Wassermann reaction has disappeared. Of the diseases in which a positive colloidal reaction is found with a negative Wassermann reaction, *disseminated sclerosis* is much the most common. In an early case of this disease, especially during the more acute exacerbations, it is usual to find the colloidal reactions positive, and even strong "paretic" types of reaction may be encountered. *Encephalitis lethargica* also occasionally causes a strong colloidal reaction, but in a much smaller proportion of cases. Sometimes, however, a weakly positive colloidal reaction may be the only abnormality in the fluid in cases of post-encephalitic Parkinsonism or other sequelæ of this disease. In *Mongolian idiocy* also the colloidal reactions are often positive with an otherwise normal fluid.

The usual number of cells found in various diseases is shown in the table. To some extent each disease has its characteristic type of reaction. Coccal meningitis causes a polymorphonuclear reaction. Tuberculous meningitis and poliomyelitis either the lymphocytic or mixed type, and syphilis the lymphocytic type. Disseminated sclerosis and encephalitis lethargica (in most epidemics of this disease) cause a pure lymphocytic reaction. But here also we meet with anomalous cases. Cerebral tumours usually cause no excess of cells, but occasionally a fairly intense reaction of the mixed type or even of the polymorphonuclear type is encountered. The latter finding would suggest cerebral abscess, but may occur when a glioma is undergoing degeneration. As a general rule, however, the presence of a high polymorphonuclear cell count indicates microbic infection of the meninges or nervous system. In cases of otitis media or inflammation of the accessory nasal sinuses, the presence of polymorphonuclear cells in the fluid, even if no organisms can be found in it, is a sign that the inflammation is approaching or has reached the brain. Such a fluid is often found when inflammation has spread to the dura mater, and the term "meningitis sympathica" has been given to such cases. The fluid may be almost clear, but is often turbid or even almost creamy in appearance. It may be distinguished from the fluid of generalised septic meningitis by the absence of organisms in films and in culture. It should, however, be regarded as a danger signal which calls for careful watch by the surgeon. Similar fluids may be found after blows on the forehead which have fractured the cribriform plate of the ethmoid. In such cases a channel is often left whereby organisms reach the meninges whenever the patient catches a cold, and each attack of nasal catarrh may be associated with the clinical signs of meningitis and a purulent aseptic cerebro-spinal fluid; until finally a more virulent organism, such as the pneumococcus or streptococcus, may gain access to the subarachnoid space and cause a generalised and fatal meningitis.

When the cell excess is of the "lymphocytic" or "mixed" type, and clinical signs of meningitis are present, the diagnosis often lies between tuberculous meningitis and poliomyelitis or between tuberculous and "influenzal" meningitis. By the latter term I wish to indicate cases in which clinical signs of meningitis come on in the course of an attack of influenza, and not only the cases in which Pfeiffer's "influenza bacillus" is found in the fluid. The latter

Table showing the Typical Changes in the Cerebro-spinal Fluid in Various Diseases.

—	Normal.	Meningitis.			Disseminated sclerosis.	G.P.I.	Tabes.	Meningeal syphilis.
		Meningo-coccal.	"Influenzal."	T.B.				
C.S.F.	Clear; colourless, no coagulum.	Ginger-beer turbidity; coagulum.	Clear; fine coagulum.	Colourless, with cobweb coagulum.	Clear; colourless.	Colourless; sometimes fine coagulum.	Clear; colourless.	Clear or turbid; sometimes fine coagulum.
Cells—								
Polymorphs	0 } Cells	200 to 2000	10 to 50	0 to 100	0	0 to 5	0	10 to 50
Lymphocytes	0-3 } per c.mm.	5 to 50	100 to 400	100 to 300	5 to 100	5 to 100	5 to 100	50 to 500
Total protein* .	20 to 35	50 to 200	30 to 100	50 to 200	30 to 60 rarely higher.	40 to 100	30 to 60	50 to 200
Globulin—								
Nonne-Apelt.	0	± to +	Weak +	± to +	− to +	+ to ++	± to +	± to +
Pándy ..	− or faint haze	+ to ++	+	+ to ++	− to +	+ to ++	± to +	+ to ++
Glucose* ..	50 to 75	0 to 15	15 to 55	15 to 50	Normal.	45 to 60,	45 to 70	Normal.
Chlorides* ..	720 to 750	650 to 680	690 to 730	580 to 650	,,	Normal.	Normal.	,,
Urea*	10 to 40	Normal.	Normal.	Normal.	,,	10 to 60	10 to 60	,,
Langes—								
(Colloidal gold)	Negative, or at most 001110000000	Variable.	Usually negative.	0000123320	5544321000 or 123210000 or negative.	5554432110 or 444321000	0014320000 or 1354321000	5543210000 or 1354321000
Other colloidal reactions.	No change.	,,	,,	Variable.	Similar changes.	Similar changes.	Similar changes.	Similar changes, often fairly intense.
W.R.	−	−	−	−	−	+	+ in 80% − in 20%	+
Kahn and Sigma	−	−	−	−	−	+	Usually +	+
Culture	No growth.	Meningo-cocci.	No growth.	No growth. T.B. in films.	No growth.	No growth.	No growth.	No growth.

* mg. per 100 c.cm.

Cell Count.

Although the cell count is the most important part of the examination of the cerebro-spinal fluid, it is the least specific, as many forms of disease of the central nervous system are associated with an increased number of cells. It is useful to distinguish three types of reaction according to the differential cell count:—

1. The "polymorphonuclear type" when more than 75 per cent. of the cells are polymorphonuclear.
2. The "lymphocyte type" when over 90 per cent. are mononuclears.
3. The "mixed type" in which polymorphonuclears form rom 15 to 70 per cent. of the whole.

are much more serious than the former, although after infancy only about 50 per cent. are fatal. Meningitis in the course of influenza, on the other hand, usually disappears very rapidly after lumbar puncture; but the appearance of the fluid resembles that in tuberculous meningitis so closely that a needlessly unfavourable prognosis may be given. In this form of meningitis and in poliomyelitis the normal percentage of chlorides and of glucose distinguish the fluid from that of tuberculous meningitis, in which both these substances are reduced, the chlorides usually to a level between 600 and 650 mg. per 100 c.cm.

Meningeal syphilis, especially that which occurs during the secondary stage, may be associated with a very great excess of cells, either of the mononuclear type or of a mixed type in which polymorphonuclears form up to 50 per cent. of the total. The fluid may appear turbid and give a cobweb coagulum on standing. There is, however, little reduction of glucose or chlorides and the presence of a positive Wassermann reaction settles the diagnosis. If, however, no suspicion of syphilis arises, and the Wassermann reaction is not performed, the appearance of the fluid may easily lead to a wrong diagnosis.

Occasionally considerable excess of cells may be found in association with a normal percentage of protein. This syndrome, to which the name *cell protein dissociation* has been given, is confined to a few diseases, of which disseminated sclerosis, encephalitis lethargica, and poliomyelitis are the most common; even in these diseases it is the exception rather than the rule. In the other inflammatory diseases of the nervous system, excess of cells is always associated with excess of protein, although the relative increase in these two elements varies greatly; large numbers of cells may be associated with only slight increase of protein, and highly albuminous fluids may contain comparatively few cells.

Protein Excess.

The protein of normal cerebro-spinal fluid consists chiefly of albumin with a smaller proportion of globulin, and when the protein is increased this relationship holds good; there is, therefore, always much more albumin than globulin except in the solitary instance of general paralysis in which the globulin may equal the albumin. It is, therefore, inexact to speak of globulin excess as though that were the only protein fraction which mattered, for something may be learnt from a rise in the total protein even when no excess of globulin can be found. It is true that a slight excess of protein by itself does not give so definite an indication of disease as when it is associated with a positive Nonne-Apelt reaction (see below), but any excess above 50 mg. must be considered pathological, and this may be the only definite abnormality present. A total protein of 50 to 60 mg. is associated, in general paralysis, with a fairly strong Nonne-Apelt reaction, and in tabes dorsalis with a rather weaker reaction. When the protein rises above this level it is always accompanied by positive globulin reactions, and the balance between protein and globulin is not quite so easily estimated. It appears, however, that a fair index of this balance is afforded by the colloidal reactions; in fact, whatever of specificity these reactions possess, appears to be due to the balance between albumin and globulin.

Globulin Tests.

Of these the Nonne-Apelt is certainly the most satisfactory, as in it even the slightest haze is pathological. It consists in the addition of cerebro-spinal fluid to an equal quantity of a saturated solution of ammonium sulphate. Cloudiness or opalescence is a sign of a positive result. The Pándy reaction is of value also, as it shows at once where protein excess is absent. In this test a drop of cerebro-spinal fluid is added to a c.cm. of saturated phenol solution; when it produces no immediate haze or opalescence it is possible to say that protein and globulin are within normal limits. The test, however, may give weak positive results with normal fluids.

Just as the syndrome of cell increase with normal protein is only found in a few diseases, so also the opposite syndrome of considerable protein excess with normal cells has its special diagnostic significance. This combination was called by Nonne the "compression syndrome," as it is commonly found in compression of the cord. It may also occur in cases of cerebral tumour, although in this disease it is the exception rather than the rule. It may, however, be found in polyneuritis, and in cases of localised meningitis, such as may occur around a focus of myelitis, and it may be present a few weeks after an attack of poliomyelitis. Therefore, even in paraplegic cases, it does not necessarily indicate compression of the cord, and its value in this respect is very much less than that of manometric readings and the Queckenstedt sign. Similarly, in cerebral diseases we rely more on the manometer than on the alterations in the fluid to tell us whether we are dealing with cerebral tumour or with thrombosis of cerebral vessels.

Two examples in which some of these points occurred may help to emphasise them.

CASE 1.—A man between 30 and 40, a cocktail habitué, suffered from neuritis, with extreme tenderness of his legs. He had also deteriorated mentally, his memory was poor, and he was facile in manner, rather pleased than otherwise that his paralysis was due to toping. In view of his habits cerebral syphilis could not be excluded. Lumbar puncture gave a clear fluid with only 15 cells in 10 c.mm. It contained three times the normal amount of protein (100 mg. per 100 c.cm.), but only gave a very weakly positive Nonne-Apelt and a weak positive Pándy reaction. The Wassermann and colloidal gold reactions were completely negative. The fluid, therefore, only gave indications of polyneuritis, and cerebral syphilis could be excluded.

CASE 2.—A man of 36 had suffered for three years from weakness and numbness in the left leg. This had improved after the first few months so that he could play tennis, but it had recently returned, and with it similar symptoms had appeared in the right leg and arm, so that writing was now difficult. Lumbar puncture gave a clear colourless fluid containing 26 lymphocytes per c.mm., with 60 mg. of protein, and giving definitely positive globulin reactions (Nonne-Apelt +, Pándy ++). The colloidal gold reaction gave a weak "paretic" curve 4442211100. The Wassermann reaction was negative in cerebro-spinal fluid and blood. The diagnosis of disseminated sclerosis, which was confirmed by this report, was subsequently proved at autopsy.

These examples show that the strength of the globulin reactions may bear very little relationship to the quantity of total protein present.

Glucose; Chlorides; Urea.

To some extent the amount of these substances in the cerebro-spinal fluid varies with that in the blood. In the case of *urea*, as has already been said, the percentage in the two fluids is always identical. The *chlorides* in the cerebro-spinal fluid are always higher than in the blood, and the *glucose* always lower. For the *chlorides* the relationship is fairly constant at 1 to 1·25, even in cases where the cerebro-spinal fluid chlorides are reduced. In fact, recent work has shown that the reduction of fluid chlorides which occurs in meningitis is chiefly due to their reduction in the blood. None the less this reduction is of definite diagnostic value. As regards *glucose* in the spinal fluid the normal relationship of from 45 to 65 per cent. of the blood-sugar remains fairly constant except in meningitis; in this disease the glycolytic ferments set free by dead cells or bacteria break up the glucose as quickly as it reaches the cerebro-spinal fluid from the blood. Consequently it is always low and continues to be destroyed after the fluid has been drawn off. In the early stages of tuberculous meningitis, however, glucose may be present in almost normal amount. In aseptic, purulent fluids the amount of glucose varies greatly. Sometimes it is absent, in other cases abundant. This seems to depend on the number of polymorphonuclear cells which have been killed by bacterial toxins. Excess of mononuclear cells seems to have little effect in reducing the glucose in the fluid, at any rate if the examination is made immediately the fluid is drawn off, but in tuberculous meningitis some reduction of glucose is always found, whatever the type of cell present.

Special Articles.

MENTAL DISORDER AND DEFICIENCY IN 1927.

THE SHORTAGE OF ACCOMMODATION.

THE Board of Control, in their Report for 1927,[1] lay stress on several problems of increasing urgency. Everyone in any way connected with lunacy administration will share their great regret that no legislation has yet been introduced to give effect to the recommendations of the Royal Commission of 1926. The passage of the Mental Deficiency Act, 1927, was, however, an event of far-reaching importance. Not only have various difficulties been removed which were inherent in the Act of 1913, but the new Act defines mental defect and, by the changes which it introduces into the definition of the four categories of defectives, enables provision to be made for post-encephalitic and other similar cases.

The shortage of accommodation for mentally diseased patients and mental defectives alike is increasingly serious, but whereas the large majority of the counties and county boroughs have either provided a mental hospital of their own or possess a share in one, not a single local authority has itself provided sufficient institutional accommodation to meet the needs of its own defectives, and scarcely 18 per cent. have provided any accommodation whatever. Of all persons annually sent for treatment under the Lunacy Acts, 93·5 per cent. are received into county or county borough mental hospitals, but upon the lowest calculation the number of defectives who require institutional care and cannot have it is not far short of 20,000. The Board, however, oppose strongly the suggestion, at first sight reasonable, to concentrate for the time upon the provision of accommodation for defectives and to relax efforts to accommodate mental patients. "No such policy ought to be countenanced for a moment," they say, "nor ought any rivalry to be admitted between the two components of this dual need." The two problems are complementary, and one cannot be considered without the other. The Board regret that advantage has not been more often taken of Section 28 of the Mental Deficiency Act of 1913, which permits one committee to be constituted for the purposes of both Acts. The ruling factor, of course, as they point out, is public opinion. The community now fully realises that provision for the requirements of certified patients is an absolutely unquestionable duty. What it has yet to realise is that a large number of these patients would never have become certifiable if they had had proper treatment at an early stage, and that a large proportion of the poor-law expenditure and of the cost of the prison service is traceable to neglect in caring for mental defectives.

The Mental Hospitals.

On the first day of 1928 the number of notified insane persons under care in England and Wales was 138,293, an increase over the figure for 1926 of 1667. The number of direct admissions was 21,893, 31 less than in the previous year. The ratio of admissions per 10,000 of the populations aged 16 and over is now 7·66, and the table given in the Report shows a steady decline in the last seven years. The general recovery-rate is 31·43 per cent. of direct admissions, and the general death-rate is 7·94 per cent. of the average daily number registered, against 7·30 per cent. for 1926; this is the first rise in the death-rate since 1922. The number of patients resident in county and borough mental hospitals increases on an average by 2529 every year. The number of vacancies, on the other hand, in spite of the reopening of Ewell Colony, Epsom, has decreased from 2319 in 1926 to 1570 at the beginning of this year. Moreover, whereas on Jan. 1st, 1927, there were vacancies for 148 women, there was in January of this year a deficiency of recognised bed space for 34. The position, in the words of the Board, has become critical. As a temporary measure Ewell Colony, originally a hospital for male epileptics, was reopened last year as a mental hospital with beds for 100 men and 329 women, and it is estimated that by the end of this year various small additions and rearrangements will have provided accommodation for another 1250 patients—barely half the average annual increase. "It is evident that such makeshifts will do very little to ease the general situation, and unless energetic measures are promptly taken serious overcrowding of these hospitals is inevitable." At the moment only two authorities, Middlesex and Swansea-Merthyr Tydfil, are building new institutions. The situation is complicated by the fact that 15 local authorities, responsible for nearly 2500 patients, have no mental hospital of their own but contract with neighbours to receive their patients. Now that very few mental hospitals have any vacancies, the larger of the authorities with no institution of their own are finding it extremely difficult to secure accommodation. As a rule they have not sufficient patients to make the erection of a hospital economical, and the solution suggested by the Board is that they should arrange with neighbouring authorities who own institutions to extend them sufficiently to accommodate their patients for a number of years.

Mental Deficiency.

Serious as is the shortage of accommodation for "lunatics," the position of the constantly growing army of defectives who require institutional treatment is much more so, and the Board report that, unless a great effort is made in the immediate future, it will become difficult and even impossible to administer the most important sections of the Mental Deficiency Act. Urgent cases needing prompt action frequently come to the notice of the Board, and no vacancies can be found. On the first day of 1928 the number of defectives in institutions was 20,429; at the most moderate estimate—1 per 1000 of the whole population—the number requiring treatment is 39,067. During the last six years the number of defectives of whom local authorities have obtained knowledge has increased from 25,470 to 61,522; many of these are reported to local authorities because they have got into trouble of some kind and need protection in institutions. The figures for the last few years of defectives recommended by education authorities show a progressive increase, which will become more rapid as education authorities awaken to the necessity of further care for defectives leaving school. Although most of these authorities have not completed their ascertainment and some have hardly begun it, the January returns show that 1479 cases are "awaiting removal to an institution." Moreover, on Jan. 1st there were 265 defectives in "places of safety," that is, detained. This measure was clearly intended merely to ensure the safe custody of a defective during the fortnight or three weeks before a petition is presented, and detention for considerable periods without training or proper classification is obviously very unsatisfactory. Of equal importance, in the Board's opinion, is the great and increasing difficulty in finding accommodation for cases reported from prisons, who otherwise have to remain where they are under admittedly undesirable conditions. The Board do not mention, but certainly do not overlook, the deplorable handicap that rests upon the infant but highly beneficial enterprise of those benches of magistrates who employ trained psychologists to help them to keep defectives out of prison. Finally, the lack of accommodation in proper institutions results in the certification of a very large number of mental defectives under the Lunacy Acts, especially of low-grade and troublesome patients, for whom managers of small institutions and boards of guardians are naturally unwilling to shoulder the

[1] Fourteenth Annual Report of the Board of Control. Part I. H.M. Stationery Office. Pp. 87. 1s. 9d.

responsibility. Mental hospitals would be short enough of beds even if they were not obliged to shelter defectives, whom they cannot benefit and who hinder the recovery of other patients. The Board consider the need to be so urgent that they devote much space in their Report to an eloquent restatement of the numerous irrefutable arguments in favour of an immediate and adequate effort by all local authorities to found sufficient colonies to house all the defectives who in the interest of the community should be cared for in special institutions. The present shortage is, in their opinion, not entirely due to difficult financial conditions, but is sometimes the result of a failure by the local authority to realise the importance and gravity of the situation. Mental defectives are very prolific and always beget defectives; defective parents inevitably create centres of degeneracy, disease, inebriety, pauperism, and crime, for which local authorities cannot escape responsibility. The greater number of defectives who are given training early in life can be rendered harmless and amenable, cured of obnoxious habits, and under favourable conditions and proper supervision made self-supporting. The duty of all whose words carry weight with those responsible is obvious: to press and to continue pressing for the full and adequate recognition of the vital importance of this problem to the nation's health.

The New Mental Deficiency Act.

The most important alteration of the law governing defectives is made by the section which replaces Section 1 of the old Act; instead of limiting mental defect to conditions dating "from birth or from an early age," it defines it as "a condition of arrested or incomplete development of mind existing before the age of 18 years, whether arising from inherent causes or induced by disease or injury." The new Act thus includes defect resulting from encephalitis lethargica, epilepsy, and other diseases. The Board do not summarise the Act in detail, but point out certain other important amendments. The class of patients "subject to be dealt with" now includes any patient of whom his parent or guardian has represented to the local authority that he needs care or training that cannot be provided in his home. The parent's consent may now be dispensed with when he is abroad and the attempt to obtain it would mean undue delay. When a court has ordered a certificate and it has been found impracticable to present one, or the court has dismissed it and the case is left unsettled, the temporary detention may be extended. The local authority is charged with providing suitable training or occupation for defectives under supervision or guardianship or in certified institutions, and authorities which exercise dual powers under the Mental Deficiency and Education Acts may provide ordinary certified schools which can be at the same time certified institutions for defectives.

The Board reprint much of what they wrote last year on the marriage of defectives, and state that in the light of fresh experience and resolutions they have received from a number of local authorities, their opinion is that the time has come when definite legislative steps should be taken to prevent the marriage of those under Order. They have not, however, seen any reason to modify their attitude towards sterilisation, which they do not think promises any substantial help towards solving the problem of accommodation. They comment again on the wide variation in the returns sent in by the various local authorities of defectives ascertained during the year. The figures vary between 4·66 and 0·03 per 1000 of the population, a discrepancy greater than can be accounted for by any possible difference of local incidence. The Board state that the methods of local authorities returning low figures call for improvement, and recommend the employment of a specially trained officer or the use of the services of a specially trained secretary of a voluntary association.

The number of defectives under guardianship has increased by 252, but 49 authorities have not a single case under guardianship, and 29 others have only one or, at the most, two. The Board reiterate their warning of last year urging care in the selection both of guardians and of cases for guardianship; in this field their experience has been closely parallel with that of the Scottish Board.[2] The search for suitable guardians should, they say, be organised and not left until urgency arises. A list may be submitted by the ascertainment and supervision officer, or a guardianship society can be formed; some such plan should be set on foot in every district, to prevent the sending of defectives far from their own counties and their own local authority. The northern counties have so far no organisation of this kind.

Mental Nursing and Other Matters.

The Board commend the progress made in providing detached nurses' homes, which not only set free very necessary accommodation but tend to raise the status of mental nurses and the standard of their work. They promise a fuller discussion of the subject in a future report. Meanwhile, they notice with great pleasure the opening in June, 1927, of the new nurses' home and training school at the County Mental Hospital, Maidstone. By far the largest of its kind, this home accommodates 136 sisters and nurses; it is separate from the hospital, cost £46,000, and set free space for 160 beds.

The commemoration of the Pinel Centenary called for a historical article on mechanical restraint at the end of Part I. of the Report, and the work of the voluntary associations is warmly commended. There is a note on the mental after-effects of encephalitis lethargica. Part II. of the Report contains, in addition to statistical tables, entries by commissions at institutions and other matter, a supplement setting out or mentioning 65 contributions submitted to the Board on clinical and pathological research and routine laboratory work carried out in institutions visited by them. Five of the papers deal with biochemical problems, five with encephalitis lethargica (including two dealing with its treatment by malaria), ten with general paralysis, and four with treatment in general. Only two deal with histology, a subject which the Board consider does not nowadays receive sufficient attention. The Board commend the work highly, exhort every medical officer to contribute his share to it, and encourage the record of negative equally with positive findings.

THE LONDON MEDICAL EXHIBITION.

(*Continued from p. 729.*)

BOOTS PURE DRUG CO., LTD. (Nottingham), displayed photographs of their analytical, research, and manufacturing laboratories as a background to a representative selection of their standard products, among them being Stabilarsan, Sulphostab, Thiostab, Bismostab, and Vaccines (St. Thomas's). In addition there was an interesting display of the synthetic antiseptic Acriflavine, and prominence was given to a series of pharmaceutical products of this non-irritant bactericide; pessaries, gauzes, solution tablets, bougies, an emulsion as a surgical dressing, and an oral tablet as a urinary antiseptic. Capsules and tablets of Hexyl-Resorcinol were also on exhibit and a solution in glycerin with "low surface tension advantages" when used as a surgical dressing. Liver Extract "Boots" (M.R.C. approved process) in various forms was exhibited and also Cholumbrin for cholecystography, and Viules, a series of sterile ampouled products. Insulin and Ephedrine were also shown.—E. H. SPICER AND CO., LTD. (Watford, Herts, and 72, Wigmore-street, London, W.). One of the prominent exhibits on this stand was Calsoma, the tribasic phosphates of calcium and magnesium, sodium biphosphate, and magnesium citrate in effervescent form. This has proved a useful gastric antacid,

[2] THE LANCET, August 18th, p. 339.

relieving the distressing symptoms of gastric and duodenal ulcer. Another exhibit was Solvochin. This preparation is a 25 per cent. solution of quinine in stable form for injecting large doses of quinine intramuscularly without local irritation. Bacillus Acidophilus Emulsion was also shown and a complete line of "Homburg" specialties.—THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD. (51, Bowes-road, London, N. 13), presented "Thyroxine" for use in obesity, myxœdema, troubles of growth and development, cachexia, and oliguria; and Isacen, a tasteless, odourless, non-toxic aperient as well as Somnifaine, a liquid hypnotic, and Sedobrol, a tablet which masks the taste of the contained bromide in the bouillon which the tablet is intended to make.

COATES AND COOPER (41, Great Tower-street, London, E.C.), among a large number of pharmaceutical preparations, showed "Salvitæ," which is claimed to be preferable to ordinary preparations of lithium, and "Presoiod" Pregls', a stainless iodine for oral use and injection. This firm are the agents for the American Apothecaries Co., N.Y., the Temmler Chemical Works, Berlin; and Reed and Carnrick, Jersey City, N.Y.; the latter firm showing, among other preparations, Peptenzyme, containing the enzymes which enter into the process of digestion; Protonuclein, mixed glands for correcting insufficiencies of the internal secretory system; and Nephritin, obtained from the cortex and convoluted tubules of young fresh kidneys. Testacoids and Ovacoids were also exhibited. Coates and Cooper also represent THE BATTLE CREEK FOOD CO. (Michigan, U.S.A.), who showed "Laxa," a laxative biscuit; "Paramels," mineral oil in caramel form; and "Food Ferrin," a new iron food.—PAINES AND BYRNE, Ltd. (31, Southampton-street, London, W.), made a display of glandular products, drawing particular attention to Ovarian Hormone—Glandofolin—standardised to 40 mouse units per ampoule, and an extensive range of pluriglandular tablets. Many pharmaceutical products were also shown.—DIMOL LABORATORIES, LTD. (40, Ludgate-hill, London, E.C.), had an exhibit of their product which is prepared in the form of pulverettes, syrup, pastilles, lavage powder, ointment, insufflation powder, dentifrice, and dusting powder. A bactericide 35 times more efficient than phenol, it is not absorbed, but is voided with the fæces.—ICHTHYOL CO., LTD. (18, Adam-street, Adelphi, London, W.C.). Ichthyol, the product of this company, is made from the raw material obtained from the exclusively owned quarries at Seefeld, in the Tyrol, and is therefore genuine. The preparation called forth many inquiries. "Ichthargan," "Ichthoform," and "Ichtholan" (10, 20, and 50 per cent. salve), Albichthon (colourless), and Bristow's medicated "Ichthyol" toilet preparations were also shown.—THE MOND STAFFORDSHIRE REFINING CO., LTD. (47, Victoria-street, London, S.W.), exhibited samples of Monsol products together with literature explaining the uses of the preparation.

SCHERING, LIMITED (3, Lloyd's-avenue, London, E.C.), in addition to a number of useful medicinal products, showed Veramon, an analgesic; Medinal, a rapidly acting hypnotic and sedative; and Neutralon.—CHAS. ZIMMERMANN AND CO. (CHEMICALS), LTD. (9–10, St. Mary-at-Hill, E.C.). The display by this firm included Posterisan, a local vaccine from *B. coli communis* in the form of ointment and suppositories for the treatment of hæmorrhoids and allied conditions; Asthmolysin (Weiss), a standardised suprarenal pituitary compound; and Idozan (5 per cent. Fe), a neutral, easily assimilable form of iron as ferric hydroxide in a labile colloidal suspension. Kathiolan, the Danish treatment for scabies, was also shown.—PARKE, DAVIS AND CO. (50–54, Beak-street, London, W.), among a fine selection of biological and pharmaceutical products, showed Metatone, a tonic elixir containing vitamin B and nucleic acid in combination with glycerophosphates; Oxytocin and Vasopressin, two active principles of the posterior lobe of the pituitary body; as well as Paroidin, a standard extract of bovine parathyroid glands, for use by injection.—BRISTOL-MYERS COMPANY (112, Cheapside, London, E.C.), in addition to Sal Hepatica, a well-known and useful effervescent saline laxative, showed Ziratol, an antiseptic of the naphthalene series of phenols, for use in dental disorders, in gynæcology, and in minor surgery, and also Ipana Tooth Paste, which, while cleansing and polishing the teeth, exercises a germicidal effect on the oral cavity and hardens soft, spongy, and bleeding gums. Here it is convenient to mention KOLYNOS INCORPORATED (Chenies-street, London, W.C.), who exhibited their Kolynos Dental Cream, which is free from grit and is a reliable antiseptic for pathological conditions of the mouth. Another form of the preparation can be used as a mouth-wash, while a Denture Powder is a convenient preparation for cleansing artificial teeth and dental plates.—THE ANGIER CHEMICAL CO., LTD. (86, Clerkenwell-road, London, E.C.). At this stall was displayed the Emulsion (petroleum with hypophosphites) which bears the name of the firm. The petroleum which it contains is purified by a special process and it forms a perfect emulsion, the oil globules being very minutely and evenly subdivided. BARNOLD, LTD. (7 and 8, Milverton-street, London. S.E.), made a feature of Tabellæ Cerevisiæ Compound, a standard yeast tablet for the treatment of furunculosis, acne, and allied complaints, and of Tab. Calcilac. containing calcium glycerophosphate, 5 per cent., in sweetened dry milk. The claims as to the efficacy of this compound in wasting conditions are supported by experiments made on mice and rats.

THE ANGLO-FRENCH DRUG CO., LTD. (238A, Gray's Inn-road, London, W.C.), showed, in addition to their well-known Stannoxyl, Mycolactine, Orargol, and Acecoline, stabilised Acetycholine Hydrochloride, a powerful excitant of the vagus, for the treatment of Raynaud's syndrome and hypovagatonia; Trinitrine Cafeinée (Dubois), a presentation of trinitrin in quite a new pharmaceutical form—viz., soft-centred sugar-coated pills, for mastication in cases of angina pectoris, the "per lingual" absorption of the trinitrin being rapid, assuring an immediate hypotensive action; and also Iodaseptine and Septicemine, two intravenous bactericides which appear to be efficacious in all chronic and acute infections.—MODERN PHARMACALS, LTD. (2, Calthorpe-street, London, W.C.), had a display of the original Subcutaneous Arsenobenzene Sulfarsenol in a comprehensive range of doses varying from ¼ to 96 cg., which, apart from its value in syphilis, appears to have a field of application in puerperal infections; Tetrasthenol, an efficacious organic combination of iron, arsenic, glycerophosphate, and strychnine, for hypodermic injection; Biscam, a new bismuthic product, Bismuth Camphorate in ether-washed olive oil, for the treatment of syphilis; and Cedroc capsules of pure essential oil of *Cedrus atlantica*, for the treatment of gonorrhœa and cystitis.—THE SACCHARIN CORPORATION, LTD. (72, Oxford-street, London, W.), drew attention to Causticin, a preparation specially put up for the use of dentists as a nerve devitaliser, and exhibited Novocain in powder, tablets, and sterilised solution in ampoules and bottles. Trivalin in solution and capsules, a morphia substitute of quick action which, it is stated, leaves no bad effects, was also made prominent.—WHIFFEN AND SONS, LTD. (Aldersgate Chemical Works, Carnwarth-road, Fulham, S.W.), showed a new therapeutic agent, Staniform, combining tin and a methyl radicle of iodine. Its antiphlogistic, analgesic, and antiseptic properties seem to be well substantiated by clinical evidence. It is made in the form of an ointment and a dusting powder. Another new compound of tin shown by this firm is Lactate of Tin Methyl.—BENGUÉ AND CO., LTD. (24, Fitzroy-street, London, W.), showed the Dr. Bengué's Balsam, which is a combination of menthol, methyl salicylate in lanoline basis, Pulmo (Bailly), an organic combination of calcium, phosphorus, and guaiacol; and Lipiodol (Lafy), which is pure iodine (40 per cent.) in oily suspension, for intramuscular injection.—PROMONTA CO., LTD. (127, Regent-street, London, W.). Amongst the exhibits shown by this firm were

New-Promonta, an organic food preparation containing the lipoids of the central nervous system and the vitamins A, B, and D, combined with lime, iron, hæmoglobin, soluble lacto-albumins, and carbohydrates; and Hepatopson, a highly concentrated liver extract, for both of which reports and clinical statements were supplied to visitors.—GENATOSAN, LTD. (Loughborough, near Leicester). Sanatogen, Genasprin, Formamint, detoxicated and ordinary vaccines, together with calf vaccine lymph were exhibited at this stall, particular attention being drawn to Anticoryza Spray for prophylactic and curative purposes, and to an Anti-diphtheria, Scarlet Fever, and Whooping-cough Spray, for producing local immunity during epidemics.—INHALING DRUG AND APPARATUS CO., LTD. (30, Grosvenor-place, S.W.), demonstrated their Spiess-Drager drug nebulising and inhaling apparatus, which is simple to operate and can be purchased or hired.—THE PINEOLEUM CO. INCORP. (agents: Brooks and Warburton, Ltd., 40–42, Lexington-street, London) showed their standardised preparation of Pineoleum for medication of the nose and throat.

SURGICAL INSTRUMENTS.

ALLEN AND HANBURYS LTD. (Bethnal Green, London, E.), whose exhibit covered several stands, specialise in drugs as well as surgical instruments, and it should be mentioned that the drug section made a special feature of the presence of vitamin D in their Food for Infants, Malted Rusks, Allenburys Diet, and in Bynotone. A Liver Extract and a Tubercle Vaccine were also made prominent, as well as the Lister Institute therapeutic sera and vaccines.—A wide selection of surgical instruments in stainless steel was shown, attention being called to œsophagoscopy and bronchoscopy instruments, to new syringes and apparatus for hæmorrhoidal injections, and to the Universal Duralumin splint for Colles' fracture. Another interesting exhibit was the Bartholomew's Hospital pattern improved operation table. Prominence was also given to a new detachable blade knife, the method of attachment being simple and easy.—MAYER AND PHELPS (Chiron House, 59–61, New Cavendish-street, London, W.) attracted attention by a large selection of surgical instruments and hospital furniture, including forceps for introducing radium capsules and needles, and apparatus for the treatment of the larynx and œsophagus, as well as appliances for blood transfusion and a lip spoon for feeding infants in cases of prematurity and hare-lip. Another feature of the exhibit was the M.P. Clinical Lamp, which has been designed for use in the hospital ward and for general examinations by the private practitioner. Where there is no available electric current the lamp is adapted for use with an "Ever Ready" torch.—DOWN BROS., LTD. (21 and 23, St. Thomas's-street, London, S.E.). The representative collection of surgical appliances by this firm, some of which have been recently introduced, included a new set of bone operation instruments for which pneumatic power is used as a driving force. This was a constant source of interest. Many of the surgical instruments are made in stainless steel. Dressing tables and operating tables, including the "Up-to-Date," with recent improvements, were also shown.—THE SURGICAL MANUFACTURING CO., LTD. (83 and 85, Mortimer-street, London, W.), who particularly called attention to the "Barton" Sphygmomanometer, had a large exhibit of surgical instruments and appliances, sterilisers, operating tables, consulting-room couches and tables, weighing machines, improved instrument cabinets, and splints.—THE HOLBORN SURGICAL INSTRUMENT CO., LTD. (26, Thavies Inn, London, E.C.), presented a good selection of surgical instruments, both in ordinary and stainless steel, including the Minop Knife, which enables different blades to be used with one handle. The Holborn pedestal operation table was also shown.—J. T. LEACH (representative of CAMERON'S SURGICAL SPECIALTY CO., 15, Stratford-place, London, W.) made a feature of a combination of electrically lighted instruments for orificial examination, transillumination, treatment, and surgery. All the instruments are constructed to permit of sterilisation.—SHORT AND MASON, LTD. (Aneroid Works, Macdonald-road, Walthamstow, E., and 45–49, Holborn Viaduct, London, E.C.), made a display of "Tycos" clinical thermometers and the "Tycos" micro-barograph, and urinary glassware.—KODAK, LTD. (Kingsway, London, W.C.), had a most attractive display of clinical photography taken on panchromatic films, the detail of skin surface being particularly fine, while the exhibition of "medical motion pictures" by the Cine-Kodak Camera and projector was a continued source of interest to visitors.—HAWKSLEY AND SONS, LTD. (83, Wigmore-street, London, W.), presented an excellent selection of stethoscopes, ophthalmoscopes, microscopes, blood diagnostic instruments, sphygmomanometers, and physiological and anthropometrical instruments of various kinds, as well as an outfit for the injection of insulin.—BRUCE GREEN AND CO., LTD. (14, 16, and 18, Bloomsbury-street, W.C.), drew special attention among their display of optical apparatus to special combination sets for the examination of the eye, ear, nose, and throat, to the Turnville-Stewart ophthalmoscope, to the hand slit-lamp and retinoscope, and to the slit-lamp attachment for ordinary ophthalmoscopes.—DOMEN BELTS CO., LTD. (456, Strand, London, W.C.), made a feature of pregnancy, accouchement and general support, hypogastric, and gastroptosis belts, as well as belts for hernia and floating kidney. Corsets, back supports, and bandaging of various kinds were also displayed.—THE SCHOLL MFG. CO., LTD. (Granville-square, London, W.C.), exhibited arch supports and many ingenious appliances for the relief and correction of foot troubles.—ORAVOX, LTD. (26, Langham-street, London, W.), showed a wide selection of hearing aids.

LIGHT AND HEAT APPARATUS.

STANLEY COX, LTD. (39, Gerrard-street, London, W.), drew attention to a diathermy apparatus—the Intertherme—the special feature of which is the spark-gap which does not require adjustment, and to a large selection of mercury-vapour lamps, tungsten arc lamps, and various electro-medical appliances. The "Trilite" ultra-violet ray apparatus shown by this firm combines three lamps in one, and by its use many different methods of application may be made.—MESSRS. JOHN BELL AND CROYDEN (Savory and Moore, Ltd.) (50–52, Wigmore-street, London, W.) showed a complete set of infra-red lamps which produce no visible radiation, in addition to the new model quadruple arc which permits nine distinct treatments to be given by one lamp, and a new model general purposes mercury-vapour lamp.—ALLEN AND HANBURYS, LTD. (48, Wigmore-street, W.), exhibited Hanovia quartz lamps in large variety and specially directed attention to the electro-radiant "Thermega" Blanket and Rug, which not only acts as a substitute for the hot-water bottle, but airs, dries, and warms, gradually and evenly, right through the bed.—PHILIPS LAMPS, LTD. (145, Charing Cross-road, London, W.C.), made a feature of a new self-contained X ray unit, the "Metalix-Portable," making it possible for every medical practitioner to use radiography successfully. It can be operated from any convenient light socket. A full range of "Metalix" X ray tubes was also shown, including a new deep therapy tube for a current of 220,000 volts.—THE MEDICAL SUPPLY ASSOCIATION, LTD. (167–185, Gray's Inn-road, London, W.C.), who in another exhibit showed a fine selection of surgical instruments and hospital furniture, called attention to their X ray, electrical-medical apparatus, and ultra-violet light apparatus.—ELECTRICAL EQUIPMENT AND CARBON CO., LTD. (107, New Oxford-street, W.C.), exhibited various brands of therapeutic carbons and Siemens' Silit Material, which is a specially prepared medium for producing red and infra-red rays.

THE SUN RAY GLASS CO., LTD. (22, Northumberland-avenue, W.C.), had an attractive exhibit of the ultra-violet window and horticultural glass, the advantages

of which were demonstrated by models and experiments, and authoritative reports were supplied to visitors. The glass, which is hand-made, is inexpensive, and has been shown to withstand the vagaries of the weather in a remarkable manner. It is claimed for the glass that it will transmit ultra-violet rays from the sky without the visible presence of the sun, and the benefits obtained from its use go far to substantiate the statement of the manufacturers that it makes ordinary window glass obsolete.—"VITA" GLASS MARKETING BOARD (Aldwych House, London, W.C.) had an interesting exhibit of Vita Glass of various types, it being pointed out that this glass transmits to the farthest limits of the sun's spectrum the beneficial ultra-violet rays to which ordinary window glass is opaque.

(To be concluded.)

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Birth-rate.

ACCORDING to Dr. J. C. Dunlop's annual report, which has just appeared, the population of Scotland in the middle of the year 1927 was 4,891,953. This estimate is 4685 less than that for the previous year, 1926, but is 9456 more than the population of Scotland as ascertained by the census taken in the middle of the year 1921. Births registered in Scotland during the year numbered 96,672, and equalled a birth-rate of 19·76 per 1000. The births of the year are fewer than those in all previous years since 1855. The number is 5777 less than that of the previous year, 11,423 less than the mean of those of the preceding five years, and 13,576 less than the mean of those of the preceding ten years. It is the lowest Scottish birth-rate yet recorded, the previous lowest being that of the year 1917, which was 20·26. Subsequent to the termination of the Great War the Scottish birth-rate rose and attained a maximum of 28·07 per 1000 in 1920, but has since then steadily decreased, falling below 24 in 1922, below 22 in 1924, and in 1927, the year now under review, below 20. Only 6978 illegitimate births were registered during the year, a number which is with one exception, that of the year 1925, the smallest yet recorded. The number of illegitimate children born annually in Scotland is in great contrast to what was previously the case; from 1862 to 1887 the number was constantly over 10,000, and in the years 1889 to 1897 constantly over 9000.

Educational Clinics for Problem Children.

At one of the recent meetings of the British Association at Glasgow Dr. W. Boyd characterised the formation of a child guidance council in this country as an event of real consequence, for it meant that a serious attempt was being made to deal systematically with children badly adjusted to their social environment. But the more gladly they welcomed the prospect of a coördinated and extended effort to apply science to the service of childhood in trouble, the more important it was to make sure that the movement got on the right lines from the beginning. The centre of the scheme should be the public school with its atmosphere of normality and well-being, and not the hospital or the school for defectives. That meant, of course, a great widening of the scope of remedial effort. The first line of attack should not be a psychiatric clinic, but an educational clinic, staffed by experts combining a personal acquaintance with school work and a competent knowledge of psychology, concerned mainly to furnish parents and teachers with an educational prescription, and ready at need to consult the psychiatrist, and to pass on to him all the intractable psychopathic cases. So far as he knew the only such clinic in the country at the present time was the Glasgow University Educational Clinic, instituted in 1926. This clinic offered its services to teachers in the West of Scotland, and through them to parents, to help in dealing with children otherwise normal, whose training and instruction presented exceptional difficulties. Such a clinic might, he thought, be expected to develop out of its experience of difficult cases new views of the school conditions responsible for the difficulties, and thus be able to give teachers a general help beyond the prescriptions it furnished for particular children.

The Noise Nuisance.

At a recent meeting of the Public Health Committee of the Edinburgh Town Council Dr. Nasmyth outlined the history of the campaign against night noises since the time several months ago when he presented a motion on the subject. The matter had been brought before the local branch of the British Medical Association, which drew up a resolution accepted at Cardiff as the official policy of the Association:—

> That in the interests of public health the Association should support any measures which may be taken to so alter or amend existing legislation as to give greater power to local authorities to suppress unnecessary noise, disturbing to the lieges; and, secondly, any noise from 11 P.M. to 6 A.M. which is capable of being prevented or mitigated, or which is dangerous or injurious to health, shall be a nuisance within the meaning of the Public Health Acts.

Bailie Nasmyth said that noise should be included in the statutory laws of nuisances, as in the case of polluted air, water, overcrowded houses, and overcrowded cemeteries. Fear was a great teacher. It had been from fear that the most drastic sanitary codes had arisen. Fear of cholera, typhus, or small-pox led to the drastic regulations applicable to common lodging-houses, such as the notification of any infectious disease, and the summary removal of any affected person to hospital. When the public realised that noise was undermining their health or that of their families they would demand restriction. He moved the insertion of a clause dealing with noise in the next provisional order, and this was unanimously approved.

Preliminary Examination of the Scottish Universities.

The Scottish Universities' Entrance Board, at its meeting at St. Andrews on Sept. 29th, had before it the report of an inquiry into the relative standards of the leaving certificate examination and the preliminary examination. A committee, under the chairmanship of Mr. J. B. Clark, had had conferences with representative teachers of secondary schools, chiefly in Edinburgh and Glasgow, with a view of ascertaining the staff point of view. The committee decided not to recommend the Board to raise the standard of the preliminary examination, but to adopt a regulation prescribing that this examination shall be completed at not more than two sittings. The new rule will come into force in 1930.

National Insurance Dispensing.

Expenditure on the drug fund, which rose steadily from 17·5*d.* per insured person in 1921 to 25·2*d.* in 1924, continues to decline, although slowly. In 1927 the expenditure in drugs and appliances showed a fall of 2 per cent. on the figure of the previous year. The Executive Committee of the Scottish Association of Insurance Committees calls attention to the extraordinary and unexplainable differences both in frequency and cost among doctors practising in the same area and among the same class of patients. While most panel committees have fulfilled their obligation to control dispensing, a number still show reluctance to take action against their colleagues, and this differentiation is creating difficulty between one area and another. For some years negotiations have been in progress with the object of formulating a scheme for the supervision of dispensing to be adopted by insurance committees throughout Scotland. Various difficulties were encountered, in particular the unwillingness of insurance practitioners to issue the prescriptions required for test and analysis. The revised regulations now make it obligatory on them to do so, and a model scheme has been issued for use by the local insurance committee and pharmaceutical committee working in unison. Analysts in

different parts of the country have agreed to enter into agreement with the insurance committees which are recommended to consult with the panel committee as to the types of prescriptions common to the area and to submit its views to the analyst so that he may in turn select a prescription suitable for his purpose. Every effort is to be made to secure that the name of the chemist is not disclosed to the analyst.

National Insurance and the Board of Health.

The Association expresses its regret of the passing of the board system, which had many advantages. It will, it feels, be singularly unfortunate if national insurance is to be directed by civil servants who have hitherto been completely out of touch with this department of administration, and must from the very nature of things be out of touch with those responsible for local administration. The change over implies the regretted retirement of Sir James Leishman, who has been the dominating figure in national insurance in Scotland, from the passage of the Act. His great ability, strong character, and driving force were utilised to the full in bringing the scheme into being, and his departure creates a blank which it will not be easy to fill. The Association records its high appreciation of the great service he has rendered.

Lax Certification.

The sharp rise in sickness claims during 1926 was attributed to the industrial disturbance which occurred for the major portion of that year. It was believed that the return to normal industrial conditions would bring the sickness claims back to the pre-strike figures, but, while there has been a certain fall in sickness benefits, disablement benefit has continued to rise, and the claims for cash benefits for 1927 are as heavy as for the previous year. The Association finds it difficult to avoid the conclusion that lax certification has substantially increased in recent years, but various factors are operating. The difficulty of securing employment, the increasing demand for public support, the hardship on men over middle life getting back into employment—all these tend towards increased demands on the fund; in the main lax certification consists in the granting of certificates where there is partial incapacity. The reduced contributions from the Exchequer are making the position serious, and there are many societies whose solvency is endangered by the increased claims.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Dublin Hospitals.

IN an address last week to the Companions of St. Patrick, Sir Thomas Myles said that all the advantages of a modern hospital were within the reach of the poor to-day; were we going to deny these advantages to the overburdened ratepayer who supported a wife and family and was quite incapable of meeting the expenses an elaborate examination that diseases such as cancer involved? A man whose income varied from £400 to £600 a year was surely as much entitled to the scientific advantages of those charitable institutions as were the poor. There was a great deal to be said for and against a State subsidy, but he believed that the spirit of the general public was against Government control. He did not think that Government control was either economical or efficient.

Discussing the question of amalgamating some of the Dublin hospitals Sir Thomas pointed out as an objection that such a scheme would place a monopoly in the hands of a group of men. The City of Leeds was about twice the size of Dublin; yet he did not suppose that there were in that city more than four or five men capable of carrying out all classes of operative work; whereas in Dublin there were 20 to 24 men highly skilled in all classes of surgery.

Within the past week Mr. W. S. Collis, a lay governor of the Meath Hospital, has written to the daily press advocating a scheme of amalgamation of five of the smaller general hospitals. He believes that a sum of £400,000 would be enough to build and equip a hospital of 600 or 700 beds, and that the pooled incomes of the several hospitals would support it. As it is out of the question to raise such a sum in Ireland, he advocates an appeal to the Rockefeller Foundation. He quotes from a letter from Dr. G. E. Vincent, President of the Rockefeller Foundation, in which he says:—

> "Without expressing any preference or making any promises [we] will await with sympathy and interest the development of an Irish plan for improving medical education. We should naturally expect to begin negotiations on the presentation of a plan and programme which had been marked out by an officially recognised committee on which all the essential interests were represented."

Mr. Collis goes on to suggest that a committee be formed consisting of representatives of the two Universities, the five hospitals which desire amalgamation, and the two large hospitals owned by religious orders, and that this committee should draw up a scheme which might then be presented to the Rockefeller Foundation by the two Universities or by the Government at their request.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Longevity of Athletes.

THE long-disputed question whether athletics shorten life has been put to an actuarial test through the coöperation of the President's Committee of Fifty, the Carnegie Foundation, and other interested organisations. Data were obtained from ten Eastern colleges and universities, Harvard, Yale, and Cornell furnishing between them more than half the records. With the age at death known for nearly 5000 athletes who graduated in 1905 or earlier it was possible to construct a number of life tables and so to compare the longevity of these men by groups with the longevity of insured populations, according to standard life tables for the same period. The graduates of the nineteenth century showed a mortality of 94 per cent. of that expected, whereas the graduates of 1900–05 show a mortality of only 72·6 per cent. of the expected. Dr. Louis Dublin, who is responsible for the actuarial work, is inclined to think that "athletic activities in the earlier periods of loose supervision did considerable damage." It is true, of course, that even for these early days the expected mortality is slightly greater than the actual mortality, but college athletes belong to a class in which mortality should normally be well below the average of insured risks. This was demonstrated some years ago by Greenway and Hiscock at Yale, who found that although the mortality of "letter" men was less than that of the standard insurance population, it was 10 per cent. higher than that of the non-athletic Yale population. The numbers used in this latter investigation were admittedly small, but the method of controlling the mortality of college athletes by that of their classmates has such obvious advantages that further data are now being collected from the ten colleges mentioned above, to provide a control to the life tables of athletes now published by Dr. Dublin.

The cause of death was ascertained for 566 of the 1202 deaths that had occurred, and the most significant finding was the large proportion of deaths from heart disease in the age-groups over 45, no less than 32 per cent. of deaths over 45 being so attributed. Dr. Dublin points out that in an insured population it is rare to find more than 20 per cent. of deaths over 45 due to heart disease.

A Dental Survey.

The tendency to coördination of health activities, which has resulted in health councils, community chests, interlocking directorates, and so forth, has found expression in the city of Cincinnati as a Mouth Hygiene Council. A survey conducted by this body has disclosed that the city has a proportion of one dentist per 1107 population, as compared with one to 1882 for the United States. All the general hospitals are equipped for oral surgery and dental extractions. All patients entering the children's hospital are given routine dental examinations. Pre-school children are served by the dental clinic of the Babies' Milk Fund Association, while the Dental Service Society, working with the Board of Education, undertakes to look after the children in the public schools.

"Denicotinised" Tobacco.

The Connecticut Agricultural Experiment Station has undertaken the analysis of some of the processed tobaccos which claim to be "denicotined" or "denicotinised," and has also analysed a number of well-known brands of cigarettes by way of comparison. The average nicotine content of normal tobaccos was found to be 1·77 per cent, whilst the average figure for the "denicotinised" tobaccos was 1·28, or about 28 per cent. less. One firm which sells tobacco products that can be smoked "to your heart's content and with content to your heart" issues a copy of an analysis made by a New York firm of chemists who find that over 90 per cent. of the nicotine has been removed, leaving 0·1951 (sic) per cent. The same cigarettes are found by the Connecticut investigators to contain 1·02 per cent. of nicotine. And this is better than some other denicotinised cigarettes which actually contain over 2 per cent.

Homicide.

The last annual report of Dr. Frederick L. Hoffmann to the Prudential Insurance Company on homicide in the United States has aroused editorial comment throughout the country. Dr. Hoffmann shows that our murder death-rate has doubled since the beginning of this century, and for the last three years it has stood at about 10 per 100,000 population. The highest rate, 69·3, is that for Memphis Tennessee, New York, with its large foreign population, has a rate (6·1) well below the average, while Chicago, in spite of its criminal reputation, is thirty-sixth on the list with a rate of 13·3. The figure that has proved most interesting to the headlines, however, is the ratio of our murder-rate to that of England—namely, 104 to 7. The opinion of several journalists that greater severity of punishment is needed finds no confirmation in Dr. Hoffmann's report. "I have made an extended study of the death penalty," he writes, "and have come to the conclusion that it would better serve the cause of justice if it were done away with entirely."

Jews in the United States.

According to estimates made by Dr. N. S. Linfield and published by the American Jewish Committee, the number of Jews in the United States is about 4¼ millions. Forty-two per cent. of them live in New York City, 93 per cent. live in larger cities, while more than 90 per cent. live in the northern group of States. The proportion of Jews to the entire population has increased by 10 per cent. during the past ten years; in the Northern States they form 5·25 per cent. of the population, whilst the percentages in the Western and Southern States are 1·66 and 0·65 respectively. New York City is said to contain some 1,765,000, constituting nearly 30 per cent. of the population, but it is thought that the method of computing their number—namely, by counting the children who stay away from school on the Day of Atonement—is by no means accurate, the real figure being considerably higher. The Jewish populations of other cities, computed in the same way, are: Chicago, 325,000; Philadelphia, 270,000; Boston, 90,000; Cleveland, 25,000; Detroit, 75,000; Baltimore, 68,000; Los Angeles, 75,000; Newark, 65,000; Pittsburgh, 53,000; and St. Louis, 50,000.

The Tubercle Bacillus and Connective Tissue.

At the recent Congress of the American Chemical Society held at Swampscott, Mass., Prof. R. T. Anderson, of Yale University, reported experiments undertaken at the Sterling Laboratory of that University under the direction of Prof. Treat B. Johnson. Prof. Anderson has been engaged in splitting up the chemical substances derived from the growth of the tubercle bacillus and testing their end-products—fatty acids, proteins, saccharides—by introducing them into the bodies of animals. Experiments made at the Rockefeller Institute in New York by Dr. Florence R. Sabin and Dr. Charles A. Doan appear to have shown that the fatty-acid fraction of the bacillus produces tubercles microscopically indistinguishable from those due to the presence of the bacilli themselves. It is hoped, within a short time, to state the definite results obtained from each end-product separately, but it is already evident that the fatty-acid fraction determines the growth of connective tissue. The next step in this line of research would be to ascertain what agent of practical utility will inhibit this connective tissue growth.

Cookery Courses for Medical Students.

In future the medical students of Johns Hopkins University are to be taught not only what food to prescribe but also how it should be prepared. Instruction will be given by lectures and laboratory work, the laboratory being the diet kitchen of Johns Hopkins Hospital.

Dr. Franklin H. Martin, director-general and president-elect of the American College of Surgeons, states that malaria will be the first important disease studied at the Gorgas Memorial Institute at Panama. Dr. Martin, who is also the president of the institute, says that arrangements have been made with the Republic of Panama for the use of its new medical school building as a temporary laboratory for the next few years. At the last session of the United States Congress an appropriation of $50,000 (£10,000) annually for five years was made to the institute to finance this laboratory and its personnel.

Figures issued by the New York Health Department show that the city's death-rate is highest in March, with April not far behind. May proves to be a more dangerous month than July or August when the weather is at its hottest. The suggestion is made that children, young, and middle-aged people survive the heat better than the cold. It is the old to whom the heat is a serious menace.

The Beach Chapter of the Red Cross has asked the national headquarters of the organisation to "initiate a move" to raise $12,000,000 for rehabilitation of the storm-swept area in South-East Florida. A report on the conditions sent with the appeal states that the number killed by the cyclone was more than 2300 and that there were 12,000 refugees.

The Public Health Service has renewed its campaign against rats, deploring the equanimity with which people regard their depredations. The public are either unaware of the teeming rat life and its effect upon the body politic or are quite indifferent to the dangers and the cost of feeding and providing recreation for these millions of parasitic rodents. Yet without their active coöperation the fight against the rat must largely fail.

CUMBERLAND INFIRMARY CENTENARY.—The Cumberland Infirmary at Carlisle will celebrate its centenary this year. To mark the occasion, Mr. Heywood Thompson, of Nunwick Hall, has given £1000, which will be invested and the income applied to the technical instruction of the nursing staff.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

THIS annual week-end refresher course opened on Saturday, Oct. 6th, when Dr. REGINALD MILLER gave an address on

The "Intestinal Child."

Proof that intestinal disorder could produce illness was afforded, he said, by the deportment of the ordinary infant with some intestinal trouble, and it remained true that there was more virtue in a dose of castor oil than in the most modern psychology of the nursery. Further proof was afforded by cœliac disease, where the whole nervous system went to bits because the child was poisoned by fat. The "intestinal child" was sometimes brought to the doctor for anorexia, dirty tongue, and other digestive disorders, but more often for nervous trouble and not infrequently for the purpose of ascertaining whether he was, or was not, ill. It was peculiar how often the patient was accompanied by both parents, desiring to know why they should have such an excessively badly behaved child. The symptoms were unhealthiness and unhappiness. The complexion was muddy, the eyes ringed and baggy in the evenings, the tongue coated, the appetite poor, and the breath foul; the child had a peculiar smell and looked not so much ill as like a drug addict or a person recovering from a debauch. Every conceivable disorder of the nervous system might be found, particularly negative behaviour. Negativism was a child's way of bullying its parents. Many "nervous children" were primarily intestinal; the primarily nervous child was not nearly so common as ten years ago; the relationship between parent and child had on the whole been greatly improved in recent years. The primarily intestinal child was recognisable by four cardinal signs: a tumid abdomen, occasional or persistent passage of abnormal stools, the microscopical recognition of indigestion in the stool, and the presence of excess of indican in the urine. The large stomach was not marked by the parents; in fact the mother generally referred to the abdomen of her child as its best feature.

Five types of intestinal indigestion could be recognised: 1. In *cœliac disease* fat was prepared for absorption but was not absorbed; therefore a bulky and very fatty stool was passed. 2. *Starch indigestion* was not very common; it produced a very gassy stool. Large doses of paraffin produced an even gassier one. 3. *Lamblia infection* had been brought home from the Eastern theatres of war and accounted for 6 per cent. of cases. Often it did no harm, and in any case the child outgrew the symptoms which were those of chronic enterocolitis with mucous diarrhœa—but nothing whatever would get rid of the lamblia. 4. *Nut indigestion* was appearing in quite a large number of children, and often the source of the nut in the stools could not be traced. Apparently manufacturers were using crushed nut in the preparation of some food or sweetmeat. 5. Commonest of all was *toxic constipation*, so called to distinguish it from simple constipation, where the patient remained quite healthy in spite of costive bowels. The difference lay in the presence or absence of catarrhal colitis. The most important function of the colon was the refusal to absorb the toxic products which it contained. When it became inflamed, this impermeability was lost. The treatment was quite the reverse of that of simple constipation, for which roughage and aperients were prescribed. The diet must give a smooth residue to allow the colitis to subside; there should be no brown bread or oatmeal, few vegetables—and those mostly through a sieve—and no raw fruit except orange juice and crushed banana. Simple constipation might be turned to toxic by giving rough food and senna or mercury aperients. The aperient for toxic colitis must give a formed soft stool, and it was better for the child to be constipated than to be purged, since every purging meant temporary colitis Paraffin was satisfactory if it acted in doses of a drachm twice daily, but large quantities must not be given. Paraffin with phenolphthalein was useful, as was phenolphthalein in chocolate tablets. Best of all were the bile-salt preparations such as taxol. If the child would allow them, large colon wash-outs, 8 or 12 in six weeks, were valuable. Soap, of course, must not be used; the best preparation was 2 per cent. saline with 1 per cent. sodium bicarbonate to the pint, or Plombières water. One and a half pints should be administered. Threadworms were a guide to the fact that a child had colitis; they would not live in a healthy colon. These large enemas were the only effective means of getting rid of them.

Among the other lectures given on Saturday was one by Dr. HOPE GOSSE on the

Prognosis of Heart Disease.

Seven factors, he said, guided the physician in giving a prognosis of *aortic incompetence*: (1) The first was response to effort in ordinary daily life, and (2) the second was the strength of heart muscle remaining. (3) An important factor was the cause of the trouble; most serious was infective endocarditis, followed, in order, by syphilis, rheumatism, and cardiosclerosis. In the rheumatic heart age was significant, as well as the length of time that had elapsed since the acute rheumatic attack. (4) Further relapses of acute rheumatism increased the gravity of the prognosis. (5) The most important physical sign was the size of the heart, and two other modifying factors were (6) the response to treatment, and (7) the ability of the patient to adjust his life to his disease and its limitations. Since *aortic stenosis* was almost always complicated by aortic regurgitation, its prognosis was that of aortic incompetence made much more grave.

The stage of the disease was important in *mitral stenosis*. The patient never died in the first three stages—viz., those of a loud first sound only, of a presystolic murmur added after exercise, and when the murmur was present without exercise. Nobody could foretell when the fourth stage, that of auricular fibrillation, would ensue. The response to effort was a guide; it was but little impaired in the first stage. On examination attention should be paid to the length of the diastolic murmur. If the sequence of sounds was a diminuendo diastolic, a crescendo presystolic and a banging first sound, then the prognosis was bad. A mid-diastolic murmur meant that acute myocarditis affecting the auriculo-ventricular node was complicating the mitral stenosis. As the myocarditis subsided the murmur gradually moved up to the first sound.

Unless a *systolic apical murmur* were harsh, loud, and accompanied by a systolic thrill, it did not indicate mitral disease and would show no right-sided preponderance on the electrocardiogram. A systolic murmur to the left of the sternum might be produced by congenital heart lesion, and to the right of the sternum by aortic stenosis, aortic aneurysm, or roughening of the aortic valve.

The prognosis was perfect in cases of *sinus arrhythmia* and *extrasystole*, except that extrasystoles in auricular fibrillation rather limited the use of digitalis and to that extent altered the prognosis. *Auricular fibrillation* was the commonest cause of congestive heart failure, and its prognosis was very variable. One patient might die in a few days or weeks and another might not know he had heart trouble at all. An important point in distinguishing the varieties was the pulse-rate when uncontrolled by digitalis. If it was 65 or 70 the patient might live a moderately active life for 20 or 30 years. If it was 170 it would need a big dose of digitalis and delicate balance to keep it at 70. If the apex beat were in the nipple line the prognosis was better than if the heart were enlarged. An early case that could be controlled by quinidine had a good outlook, and the smaller the dose the better the prognosis. The ability of the patient to modify his life was important in this condition also.

Auricular flutter was an unstable condition which soon turned to fibrillation. In true heart-block syncopal attacks were a bad sign, but otherwise the patient might live a restricted life for 10 or 20 years.

The severest form of heart disease known was *pulsus alternans* in the absence of paroxysmal tachycardia. It occurred in late middle age, more often in men, and the patient never survived two years. The heart was always hypertrophied and the symptom was dyspnœa without other signs. The larger the heart and the worse the dyspnœa the more grave the prognosis; there was fibroid degeneration of the myocardium in all cases. The presence of albumin in the urine was a bad sign.

Angina pectoris was a symptom caused by different pathological conditions, and therefore the prognosis was very variable. The six factors in prognosis were: (1) the degree of effort that brought on an attack, (2) the frequency of attacks, (3) the response to treatment and the effect of rest in relieving the pain, (4) the presence of cardiac asthma, (5) the presence of Cheyne-Stokes breathing, and (6) the presence of pulsus alternans. The last three were very bad signs.

Sudden death was never caused by a valvular condition alone, except by embolism from malignant endocarditis. The commonest cause was bundle-branch lesion myocarditis, which could only be recognised by the electrocardiogram. Other causes were angina pectoris, auricular fibrillation, heart-block with ventricular fibrillation, and pulsus alternans.

The prognosis of *Graves's disease* treated medically was bad. One quarter of the cases would die in a few months or days; one-quarter would survive with severe symptoms; one-quarter would improve after many years; and the remaining quarter would recover altogether. Of those who died, some would die of mania, but most of auricular fibrillation with acute dilatation of the heart. It was most important to call in surgical aid before fibrillation set in; three-quarters of the cases would justify it. The policy was—be bold.

Mr. R. M. HANDFIELD-JONES described certain

Recent Advances in Everyday Surgery.

Injection Treatment of Varicose Veins.—He said glucose had failed in his hands and he had seen unsatisfactory results from the use of urethane and quinine. He had therefore confined his treatment to injection of sodium salicylate in varying strengths from 20 to 40 per cent. There were no contra-indications, except that any natural thrombosis might be allowed to subside before an artificial one was induced. The substance introduced was very definitely not tolerated outside the vein wall, and therefore it was essential that the needle be wholly in the vein. Blood must enter the barrel of the syringe before the injection, a small needle must be used, and the bevel must be a steep one. The needle should be introduced with the bevel parallel with the vein wall. There was no need to empty the vein, unless it were very full and bulging. Emptying a vein might draw it away from the needle. The injection should be made in the upright position, or a tourniquet should be applied to make the vein stand out. A firm bandage should be applied afterwards. Success depended entirely on not putting the patient to bed; the busier he was the better. A convenient way to give the injection was for the physician to call at the house late in the evening, on the eve of one of the patient's most strenuous days.

Injection Treatment of Hæmorrhoids.—This treatment was often of great value but there were definite contra-indications—viz., thrombosis, prolapse, and infection. No case should be injected if there had ever been thrombosis of an internal pile, or if the pile in question had ever had a definite infection, or if it had been prolapsed for more than 12 hours at any time. The technique also was quite different from that of injecting varicose veins; the whole object in injecting piles was to keep the solution outside the vein and produce a sterile necrosis, which led later to clotting of the varicose vein in the hæmorrhoid. Almost all of the many solutions in use had carbolic acid as a basis, and many of them were oily suspensions. These were bad, because the globules of oil separated from the acid in the barrel of the syringe, and the result was apt to be an injection of pure carbolic, which was disastrous. The pharmacopœial glycerine acidi carbolici was absolutely safe and efficient. The syringe should be a long narrow one, made of thick glass, with a very narrow calibre and a triple-finger action. The needle should be "shouldered" by having only about 1 inch of ordinary hypodermic at the point and the rest thick. Perrin's speculum was the best, as it had a sloped end and a side groove through which one pile could be made to project. The speculum was introduced far beyond the pile-bearing area, and therefore if any carbolic were spilt it only leaked inside the instrument. The patient should lie in the left lateral position, and the pile must be pushed up so that the needle entered the part where the mucous membrane of the rectum was reflected on to the hæmorrhoid. Not more than 5 minims of solution should be used, and again the treatment was essentially ambulant, so that the injection was most conveniently made after dinner in the evening. If the bowels were being opened regularly there was no need for a special aperient; the risk of sepsis was very slight where such a strong antiseptic solution was used.

Infections of the Fingers and Hand.—The anatomy of the distal pulp of the finger was unique; radiating lines of fibrous tissue passed from skin to periosteum, forming 16 or more closed compartments, one of which was the starting-point in 95 per cent. of infected hands. The patient related that he was awakened by a throbbing pain in his finger between 3 and 4 o'clock in the morning. Swelling proceeded rapidly until the finger was intensely tender. A longitudinal incision was useless, as it opened only one of the compartments. The cut must be horseshoe-shaped, as for flap excision of the distal phalanx. A small strip of rubber tissue was laid in when the flap was replaced and removed after 24 hours. The resulting scar was amazingly good. In *paronychia* the pus was never superficial to the nail, but lay in the nail bed between it and the bone. The only treatment was to make two vertical incisions, one on each side, nearly as far down as the crease over the distal phalangeal joint. A flap was reflected and a pair of sharp-pointed scissors thrust down to remove the nail under the skin. When the flap was replaced only a small window of exposed nail bed was left, which slowly grew up the finger until the old nail fell off. *Shirt-stud abscess of the palm* was seldom recognised; it resulted from a prick in the web. Incision over the indurated area was useless, because there was always a further collection of pus behind the lumbricals. The web must be split right open to release this.

Lymphangitis was apt to provide one of the most terrible things ever encountered in practice. It must be distinguished from a true pus infection in the distal pulp, as an ill-advised incision into the finger might kill the patient. The finger of lymphangitis was less tender and tell-tale red lines ran up the forearm. Not much harm was done if the doctor failed to incise a pus infection, but untold damage might result from incising a lymphangitis; therefore, in a doubtful case the knife should be left alone and the treatment consist of temporising measures such as poulticing and antistreptococcal serum. A mild lymphangitis case had a history of a prick, a slightly swollen and throbbing finger, and a flaring temperature which subsided in 24 or 48 hours. The infection might localise in four or five days to a small pus abscess at the site of infection, or there might be a considerable degree of general constitutional involvement. Sometimes, however, there was a terrible fulmination, and the patient was dead almost before treatment was commenced. The only line of treatment that was of any use at all for these cases was blood transfusion.

If the temperature leaped to 105° F. and there was a rigor, then a suitable donor should be installed in the same building immediately, ready for prompt transfusion if there was no improvement in 12 hours. It was no use transfusing a moribund patient.

Ordinary *tenosynovitis* of the palm revealed itself by sudden swelling of a finger from tip to base, with marked tenderness over the tendon only. The finger was held partly flexed, and any attempt at extension was violently resented. The incision must not be central but lateral, opposite each phalanx. If there was much pus it should be made continuous down the length of the finger and extended into the palm. If the little finger were involved the incison should be on the ring-finger side; if pus welled up from below when the palm was pressed the opening must be extended along a grooved director to open the ulnar bursa in the hand. If the thenar bursa were involved, the cut should extend alongside the bulge of the thenar eminence.

Two spaces, not well known, in which pus might collect, were the thenar and the middle palmar, between the lumbricals and the interossei. Pus in the thenar space caused ballooning of the thenar eminence, and should be released from the back by an incision along the length of the shaft of the index metacarpal, forceps being then slipped over the adductor transversus pollicis. Infection of the *palmar space* did not cause much bulging because of the tenseness of the palmar fascia; the palm might become flat instead of hollow. The space was opened from the third or fourth web, following down the lumbrical. No septic hand, no matter how bad, should ever be given up.

Dr. J. A. RYLE spoke on the

Nature and Relief of Some Common Gastric Symptoms.

After pointing out that the sensitivity of the stomach lay in its muscular coat, he said that persistent, localised pain should always suggest organic disease, while its rhythm would indicate the diagnosis. Delayed pain due to increased tension in the muscular fibres of the pyloric antrum was produced by reflex impulses, typically from a duodenal ulcer. The pain was not in the ulcer and was relieved by complete emptying of the stomach, by initiating the normal mechanism of relaxation of tonus—i.e., taking more food—and by alkalis. These acted in two ways: first by producing gas, which caused eructation and relief of intravisceral pressure; and, secondly, by relaxing the sphincters and so ensuring complete and rapid emptying. Immediate pain, typically that of ulcer of the lesser curvature, was aggravated by food and relieved by vomiting and alkalis; it was presumably caused by tautening of some circular band of fibres. Pain occurred in many other conditions, notably anything causing faulty emptying or pyloric obstruction. "Hunger" pain might be produced by some sort of reflex mechanism more remote than that of duodenal ulceration—e.g., gall-stones, cholecystitis, and appendicular disease. The same rhythm of pain might occur without abdominal disease, as in heavy smokers and worried folk who bolted their meals. Presumably this depended on some perturbation of the normal motility of the stomach. Treatment depended on the cause, and included food, warmth, and alkalis. If pain were associated with anorexia, carcinoma should be carefully excluded.

Flatulence was not entirely, but very largely, a subjective symptom. Fullness, distension, and distress extended from the epigastrium to the chest and often to the left shoulder, and were accompanied by attempts at eructation. The term "flatulent dyspepsia" should not be used, as there was no evidence that fermentation could take place in the stomach in sufficient amount to produce eructation, except in cases of obstruction, when the gas brought up smelt of sulphuretted hydrogen. Malodorous flatulence meant organic disease and was an important symptom. Odourless, repeated, noisy flatulence was always due to aerophagy, of which the patient was quite unaware, and simple explanation or psychological treatment was usually successful. It might also occur rhythmically, near the time of the next meal, in organic disease, being due partly to the altered motility and partly to the patient's attempts to relieve discomfort by eructation. In women who were "fair, fat, and forty," it was apt to indicate gall-stones, especially when described as "a bursting feeling" so that the patient had to loosen her clothes. The sensation of flatulence could be produced by an excess of gas in a normal stomach or by a normal amount of gas in a hypertonic stomach.

Nausea might be physiological, as in pregnancy, or pathological, most commonly in alcoholic or septic gastritis; it also occurred in mild chronic cholecystitis, jaundice, migraine, and labyrinthine vertigos. It seemed to depend on waves of relaxation of the muscle tone. An X ray taken during an attack of migraine would show complete quiescence of gastric peristalsis; there was temporary stasis during vertigo, and oils and fatty foods—such as caused nausea—tended to inhibit the motor activity. If associated with headache an error of refraction should be sought.

Anorexia occurred in people with poor muscular tone, in gastroptosis, acute fevers, tuberculosis (especially morning anorexia), and carcinoma of the stomach. It was perhaps the most important symptom of the "leather bottle stomach," where it was most constant. Anorexia was more sustained than nausea. Treatment depended on the cause, but rest was quite as often indicated as exercise, especially in the anæmic and debilitated.

Heartburn was the least adequately explained of all gastric symptoms, and was probably due to spasm of the cardiac end of the œsophagus. It was associated with excess carbohydrate intake, lack of exercise, and enteroptosis, but very rarely with organic disease. It was relieved by bicarbonate of soda and was not a symptom of hyperacidity.

Acid eructations were generally associated with true hyperchlorhydria and were regulated by alkalis and general treatment; the term "acidity" had become confused and vague and should not be used.

Water brash was an increased reflex activity of the salivary glands, so that a quantity of clear, tasteless, non-acid fluid suddenly appeared in the mouth, sometimes preceded by pain in the parottid. If often occurred in duodenal ulceration. Stringy, "phlegmy" mucoid secretion might be regurgitated from the œsophagus, especially in alcoholic gastritis. This was the result of hypersecretion in the œsophagus from chronic irritation.

NEW MARGATE HOSPITAL.—The Lord Mayor of London, who was accompanied in state by the sheriffs, has laid the foundation-stone of the new Margate and District General Hospital, which is to cost between £50,000 and £60,000. There will be 80 beds.

CHILD GUIDANCE CLINIC IN SPITALFIELDS FOR JEWISH CHILDREN.—We recorded this time last year (THE LANCET, 1927, ii., 716) the establishment of a clinic for the study and treatment of maladjusted and delinquent children and adolescents, under the auspices of the Jewish Health Organisation of Great Britain. The clinic is located at the Jews' Free School, Spitalfields, London, E., and is available irrespective of race and creed. It is open on Mondays, Tuesdays, Wednesdays, and Thursdays, from 6.30 to 7 P.M. The staff consists of two psychiatrists, a psychologist, and a specially trained social service worker. Besides providing facilities for skilled examination and treatment, advice is given on particular problems, and the clinic is also prepared to undertake the examination and observation of young offenders and to supply reports to magistrates and teachers. As part of the treatment children may be sent into the country or temporarily placed with foster parents or in convalescent institutions. School care committees and other social agencies coöperate in furthering the aims of the clinic by referring cases, by collecting information, and by aiding in the suitable placing of cases. Students of social science who intend qualifying for mental welfare work are offered opportunities of practical training at the clinic. The material accumulating in the course of the work is at the disposal of research students.

Correspondence.

"Audi alteram partem."

CONVALESCENT MEASLES SERUM.

To the Editor of THE LANCET.

SIR,—The leading article and the paper by Dr. William Gunn in your last issue (pp. 709 and 690) draw attention to the great loss of infant life from measles, and to the value of serum obtained from convalescent cases in protecting children who have been exposed to infection. Its use, however, need not be confined to hospitals and institutions; it will prove of equal value in private households, where a delicate child is often exposed to great danger, when measles has been contracted by an elder member of the family.

This serum has been used with success in many countries, and in several towns in France, Germany, and the United States arrangements have been made to obtain supplies. Similar arrangements could be made in this country by local authorities, hospital committees, or voluntary agencies; such work, being a preventive measure, is well within the province of a public health authority. The difficulty is to obtain the serum; but it is not a difficulty which is insuperable. Convalescent adults, most of whom are treated at home, can often spare sufficient blood, without detriment to their own health, to provide enough serum to protect from 10 to 30 children, and to be asked to give some blood, which may be the means of saving a child's life, is a request which will appeal to the generous instincts of many British citizens. The family doctor is in the best position to make such a request.

It is suggested that whoever decides to arrange for the provision of a supply of this serum should ask general practitioners and superintendents of fever hospitals to notify them of suitable patients who have consented to give some blood. It is obviously inadvisable to attempt to obtain the serum from children, as the amount which might be obtained would hardly justify the trouble of collection. Drawing off blood with aseptic precautions is not as simple as it sounds, and, except in the case of hospitals, would best be done by some doctor appointed for the purpose, who might well be a bacteriologist from the laboratory in which the serum is to be prepared. There it would be tested by the Wassermann test, and for sterility, pooled to give a more uniform standard of strength, and made up in doses ready for immediate dispatch. It will keep for many months if stored under proper conditions. The use to which it should be put must depend, of course, on the amount available, but the first consideration should be the protection of young children, who are known to have been exposed to infection, and in whom an attack of measles is particularly to be feared, either because of their age or because they are suffering from some other complaint. If the supply is ample, the serum might be used in ward outbreaks, or by giving a small dose late in the incubation period, merely to attenuate an expected attack, thereby allowing a lasting immunity to be developed without much risk. Any such supply should be available to all doctors in the district either in private or in hospital practice, and should not be restricted to those who have been able to recommend donors. A request to obtain volunteers issued with each dose would help to equalise the distribution of supply and demand, but children's hospitals would always tend to use more than they could supply. The expense of such a scheme should not be great, and would be well justified by the number of lives which would be saved.

Dr. Gunn and other writers have shown that it may be many years before a satisfactory animal serum is put on the market. In the meantime we must do what we can to save life with the material which is available. It should not be forgotten that the old-fashioned arm-to-arm inoculation against small-pox was an effective, if somewhat clumsy, method, and saved many thousands of lives. Our forefathers did not wait until sterile calf-lymph had been discovered.

I am, Sir, yours faithfully,

W. A. LETHEM,
Medical Officer.

Ministry of Health, Whitehall, Oct. 8th, 1928.

GENERAL MEDICAL COUNCIL: ELECTION OF DIRECT REPRESENTATIVES.

To the Editor of THE LANCET.

SIR,—I should be glad if you could publish a short statement in support of the candidature of Dr. E. A. Gregg and myself for election to the General Medical Council. We are asking for a definite mandate to carry a message to the Council from the general body of practitioners. This message asks that the existing constitution of the Council may be overhauled in the light of the defects which have emerged during its 70 years' existence. It suggests that a more adequate constitution should then be solicited from the Government of the day.

That such an overhaul is necessary scarcely needs arguing. Dr. H. G. Dain has pointed out one particular defect—namely, the very small representation of general practitioners. But the B.M.A. members of the Council, after the last election, issued a statement that even this suggestion had not their approval. The issue is therefore clear. On the one hand, Dr. Gregg and myself ask to be returned in order to do a definite task for the furtherance of the public welfare and that of the medical profession. On the other, two gentlemen already overburdened with various duties for the B.M.A., ask for support in order that they may increase the prestige of the B.M.A. One is bound to assume, since no other object has been announced in their name, that they propose to follow the policy of laissez faire which all B.M.A. candidates have followed hitherto.

I am, Sir, yours faithfully,

Sevenoaks, Kent, Oct. 7th, 1928. GORDON WARD.

A NEW NURSING HOME AND CLINIC FOR LONDON.

To the Editor of THE LANCET.

SIR,—The account of the new nursing home and clinic for London in THE LANCET of Oct. 6th is, as you state, incomplete. Unfortunately the scheme is not yet the accomplished fact which your article might suggest, as the difficulty of raising the necessary capital for an undertaking, which is in some part philanthropic, is very great. We hope to furnish you shortly with a detailed account of the proposed clinic.

On behalf of the advisory medical committee,
We are, Sir, yours faithfully,

H. MORELAND MCCREA,
Chairman.

WALTER HOWARTH,
Devonshire-place, W., Oct. 9th, 1928. Hon. Sec.

DEATHS UNDER ANÆSTHETICS FOR DENTAL OPERATIONS.

To the Editor of THE LANCET.

SIR,—Dr. Boyall seems to me to place the care that should be taken by an anæsthetist for dental operations at a higher standard than is usually adopted. My own experience with the use of oxygen for a prolonged administration of any anæsthetic leads me to regard it as contra-indicated in any head operations, at any rate from the surgeon's point of view, on account of the tremendously increased hæmorrhage resulting therefrom.

I am, Sir, yours faithfully,

L. ERIC CHAS. PECKOVER.

Worthing, Oct. 9th, 1928.

THE PROPOSED BAYLISS-STARLING MEMORIAL.

To the Editor of THE LANCET.

SIR,—May I draw the attention of your readers to the fund which is being raised to provide a memorial to the late Profs. Sir William M. Bayliss and E. H. Starling. Many subscriptions have now been received from all parts of the world to this fund, and the committee is particularly grateful to those contributors in foreign countries who have so generously assisted. Although a considerable sum has now been received, this is not quite large enough to provide a good annual studentship.

In thanking those of your readers who have so generously assisted the fund, may I remind others who intend to do so that subscriptions may be sent to me at the address given below, cheques being crossed Bayliss-Starling Memorial Fund.

I am, Sir, yours faithfully,

C. LOVATT EVANS,
Secretary of Committee.

University of London, University College, Department of Physiology and Biochemistry, Gower-street, London, W.C.1, Oct. 5th, 1928.

LOCAL ANÆSTHESIA IN THE REDUCTION OF FRACTURES.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on this subject in your issue of Sept. 22nd (p. 609), may I be allowed to add the following remarks?

For the last three years this has been the form of anæsthesia I have used for a good many of my private cases of forearm and leg fractures. I find it most useful for the Colles's and Pott's fracture cases, particularly for nervous ladies whose main fear is of the inhalation method. The solution I have always used is 0·5 per cent. novocaine in saline, with adrenalin. I strongly recommend this method of anæsthesia as being practical and as giving the patient the comfort of avoiding general narcosis. It is advisable in highly strung and nervous individuals to precede the local anæsthesia with a subcutaneous injection of morphia gr. ¼ and atropine gr. 1/100. The patient is recommended to go to bed after the operation. Should some unbearable pain occur hours after the reduction of the fracture—in these over-worried cases—I find aspirin or atophan very soothing. Using local anæsthesia I have several times noticed the extreme ease with which the bone fragments get replaced, particularly in the case of Colles's and Pott's fractures or fractures of the shaft of the tibia, even where the degree of impaction is very marked.

I am, Sir, yours faithfully,

A. H. BIZARRO, F.R.C.S. Eng.

Oporto, Sept. 25th, 1928.

"DENTAL MEDICINE."

To the Editor of THE LANCET.

SIR,—I am aware that an author must accept whatever comes from a reviewer, but it seems to me that in this instance your review of my book (THE LANCET, Sept. 22nd, p. 605) is the result of a misconception, both as to the object of the book and the matter which it contains. Your reviewer suggests that I have chosen quotations from medical literature which support my case, and have neglected others which militate against it. I would point out that my chapters on biochemistry were read and accepted by a competent biochemist, and the physiological arguments were submitted to a professor of physiology of International reputation before being brought forward.

My title, "Dental Medicine," is also objected to on the grounds that it is too extravagant, but the whole object of the book is to suggest that the practice of dentistry should not be limited to the surgery of the teeth simply, but that, if preventive measures are to be of any value, all the recent advances in medical science must be taken into account, and that there should exist a science of dental medicine in distinction to that of dental surgery. And, finally, your reviewer complains that I have given no figures to prove that there exists a disturbance in the acid-base equilibrium of the blood in dental caries and pyorrhœa alveolaris; yet my whole argument is, that in both these conditions it is not a disturbance of this which is the cause of the trouble, so much as that they are the natural result of the compensation of some change in acid-base balance, that in the vast majority of cases this compensation is so perfect that no change exists, or that this is so small that no biochemical methods at present known are delicate enough to show them.

This being so it would seem to be hardly fair to suggest that the book is not a fit one to be read by members of my own profession. The review appears to be the result of an imperfect appreciation of the subject matter of the book.

I am, Sir, yours faithfully,

Bournemouth, Oct. 6th, 1928. F. W. BRODERICK.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. W. J. Rankine is transferred to the Emergency List.

Surg. Lt.-Comdr. H. Hurst to *London*.

Surg.-Lts. D. R. Bertram to *Keppel* and to *Ramillies*; T. C. H. Neil to *Keppel*; and F. M. B. Dolan to *Cornflower*.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg.-Lt. T. C. Stevenson to be Surg.-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. W. J. Dunn retires on retd. pay on account of ill-health and is granted the rank of Lt.-Col.

Maj. B. H. C. Lea-Wilson is restored to the establishment.

Capt. A. K. Robb to be Maj. (Prov.).

ARMY DENTAL CORPS.

Lt. F. G. Arnold to be Capt.

REGULAR ARMY RESERVE OF OFFICERS.

Col. J. Poe, late R.A.M.C., and Lt.-Col. E. W. P. V. Marriott, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

Lt.-Col. G. S. Parkinson to be Lt.-Col.

TERRITORIAL ARMY.

Lts. N. G. Hill and N. F. C. Burgess to be Capts.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. (Bt. Col.) S. J. Fielding, from R.A.M.C., T.A., to be Col.

ROYAL AIR FORCE.

Flight Lt. R. J. K. Chattey is transferred to the Reserve, Class DII.

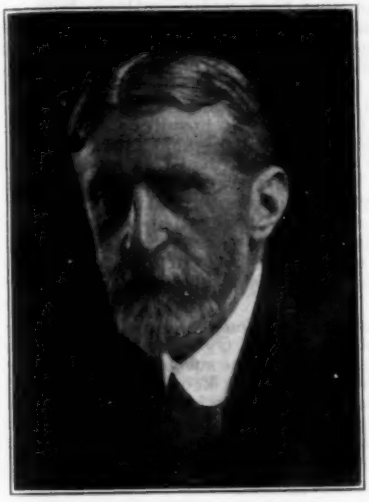
DEATHS IN THE SERVICES.

Col. Robert James Geddes, who died on Sept. 27th, at Westcliff, St. Andrews, aged 70, who was a graduate of Glasgow University, entered the Army Medical Service as surgeon in 1884, and after serving with the Burmese Expedition of 1886–89 (medals with two clasps), accompanied the Chin-Lushai Expedition, 1889–90 (clasp), and took part in the operations in Mekran, 1898. He took part in the relief of Kimberley during the South African War, 1899–1902, and was present during the operations in the Orange Free State, including operations at Paardeberg and the action at Driefontein (mentioned in despatches, Queen's medal with four clasps, and King's medal with two clasps, D.S.O.). He was promoted to Major in 1896, Lt.-Col. in 1904, and Col. in 1913. In the late war he was D.D. of Medical Services with the Second and Fourth Corps (twice mentioned in despatches and C.B.), and from 1917–19 he was Inspector of Medical Services in Scotland. He married in 1907 Christina, daughter of the late Mr. J. G. Whyte.

Obituary.

DIARMID NOËL PATON, M.D., LL.D., F.R.C.P. EDIN., F.R.S.

FROM 1906 until the end of last term Dr. Noël Paton was Regius Professor of Physiology in the University of Glasgow, and he was known to many generations of students as an admirable teacher and a man of outstanding personality. He died on Oct. 1st, the day on which his retirement became effective, and in remembering his many services as experimenter and organiser, the profession will especially recall his power of inspiring others in their work and his insistence on the medical application of what he taught.



PROF. NOËL PATON.
Photograph by Elliott & Fry, Ltd.

Eldest son of Sir Joseph Noël Paton, the artist, and nephew of Walter Hugh Paton, he was born at Edinburgh in 1859 and received his education at the Academy and the University there. As a student his talents were already obvious, and after winning the Baxter scholarship on graduating in science in 1880, he qualified in medicine with first-class honours in 1882. In the Royal Medical Society, of which he became President, he was noted for thoughtful contributions to the debates, and even then he showed a leaning towards the underlying principles of medicine. The tendency towards experimental work was confirmed by post-graduate studies at Vienna and elsewhere and by the award of a biological Fellowship at Edinburgh in 1884; but Paton nevertheless took resident appointments at the Royal Infirmary and the Royal Hospital for Sick Children, and gained the gold medal for his M.D. thesis in 1885. He became a lecturer and examiner in physiology in the University, at the same time carrying on medical practice on the staff of the Western Dispensary, but it was not until four years later that he found real scope for his ability. The Edinburgh Royal College of Physicians appointed him superintendent of its Research Laboratory—a post just vacated, after brief tenure, by Sims Woodhead—and here Paton was able to develop the work immensely, in collaboration with Sir John Batty Tuke, who was then curator. He collected around him a body of able investigators and gave them the benefit of his unusual powers as an organiser. Under his guidance the laboratory became of real value, not only as a place where accurate biological experiment was carried out, but also, by initiation of the reporting department, to medical practitioners at large. The subjects on which he chiefly worked at this time were problems of metabolism and hæmatology, and the physiology of the salmon, in connexion with which he served on the Royal Commission on Salmon Fisheries in 1900.

When Paton left Edinburgh for Glasgow in 1906 he took with him a high reputation for original work, and this reputation he maintained throughout the many years that followed. With his pupils he studied endocrine activities at a time when the subject had attracted relatively little attention, and his book on the "Nervous and Chemical Regulators of Metabolism," which appeared in 1913, contained a good many personal observations besides giving an illuminating account of what was then known about the ductless glands. In later years his attention turned more and more towards the problems of nutrition, at first in connexion with the life of the poor in Glasgow and subsequently in their relation to the scarcity of food during and after the war in this country and in Austria. In Glasgow he had every opportunity of studying rickets among the poorer classes living in tenements, and in course of time he was involved in somewhat controversial issues. For though he admitted that unhygienic surroundings and defective feeding predisposed to the disease, he strongly disputed the view that rickets was *caused* by the absence of an antirachitic factor in foodstuffs, being more impressed with the association of the disease with defective care, neglect of the home, and overcrowding. He became a leader of a school of thought on this subject, and it is, of course, only recently that further investigation of light and its effect on ergosterol has partially reconciled the opinions of this school with those of investigators who lay stress on the accessory food factor, vitamin D.

With Prof. Leonard Findlay Paton, was responsible during the last few years of his life for an elaborate study of the relations of poverty, nutrition, and growth, carried out by the Scottish Committee for Child Life Investigation. A consideration of overcrowding, underfeeding, and material inefficiency brought out the somewhat surprising fact that only the last of the three could be definitely correlated with the physical conditions of the children. Paton and Findlay set out to gain definite knowledge which would enable us to say what was the best approach to social problems as they affect the young—whether the large sums spent on child welfare and other schemes were directed into the best possible channels. They came to the conclusion that too much was being said about the ill-effect of environment and too little about the inadequacy of the slum-dwellers themselves. They found nothing to substantiate the view that "what is the matter with the poor is poverty."

The nature and scope of this work shows that Paton was far from being purely a laboratory worker; it reinforces our statement that he was keenly interested in the medical applications of physiology, and indeed their wider social applications. This conception he passed on to his students. It has been said of him that first his hearers liked the man and then they got to like the subject. Always immaculately dressed, resembling rather the artist than the doctor, he passed through difficulties with a graceful distinction that commanded respect. "Entering the class of physiology for the first time," writes one of his old students, "one was attracted by the dignified treatment of the subject and realised almost at once its fundamental importance to medicine. Clear in his language, Prof. Noël Paton was able to throw still more light on some of the difficulties by the almost magical way he was able to illustrate his points by diagrams. Moreover, he appreciated our difficulties and no trouble was too great for him in order that we should understand and appreciate the 'Institutes of Medicine.' His lectures were kept absolutely up to date; there was no soulless repetition of text-books. In this way we came to realise that knowledge had not reached finality, but was in its infancy. One thing and one thing alone he could not tolerate, and that was pretence in any shape or form. Honesty permeated his whole being and woe betide the student that pretended to understand. 'Some there are who know not and know not that they know not—Fools, shun them.' How we used to listen to these words booming through the class-room, and how we braced ourselves to the

task of escaping this classification! But Prof. Noël Paton had interests outside the class-room. There was no branch of student life which he did not appreciate, no problem which he did not ponder over. He was ever ready to give advice whether on apparatus for an experiment or on the choice of a career. His old students were always calling on him or writing to him and always they received courteous treatment with an honest opinion. His death has removed a friend and counsellor, but his memory remains with us as an inspiration."

Prof. Findlay writes: "My first meeting with Noël Paton was shortly after he came to Glasgow, when I approached him for permission to work at experimental pathology (the subject was rickets) in his department. He made me very welcome, as he has done many succeeding young graduates desirous of carrying on research. Paton was an admirable director of a department; he not only saw that one got all the facilities necessary, but he interested himself in all the work which was being done, gave freely of his own experience in the devising of experiments, in the collection of literature, in helping at operations on the animal, at which he was himself most expert, and in the final analysis and putting together of the results. The six volumes of 'Departmental Papers,' covering a wide field of physiology and experimental medicine, reveal the success with which his labours were attended. After a few years I was privileged to become one of his collaborators, an association which only terminated with his retirement from the professorship. Paton was an ideal co-worker; no one but could be enthusiastic in the search after the secrets of nature while working in his company; he always took a big share in the work himself; he had the faculty of giving criticism tactfully and the happy gift of taking criticism freely, so that the longer one was associated with him the greater did one's love and admiration for him become."

Prof. Noël Paton was elected a Fellow of the Royal Society in 1914 and was a member of the Medical Research Council from 1918 to 1923. He married in 1898 the daughter of the late Alexander Balfour, of Dawyck, in Peebleshire, where he later made his home. He is survived by his wife with one son and one daughter.

WILLIAM HUGH FENTON, M.D. BRUX., M.R.C.S. ENG.

WE have to record the death of Dr. Hugh Fenton on Oct. 5th at Hereford, where he was living in retirement. Born at Shardlow in Derbyshire in 1854, he was the son of a medical man, and entered Merton College, Oxford, in 1872 with a scholarship in natural sciences. He received his clinical training at the London Hospital, where he was surgical scholar and Duckworth Nelson prizeman in 1879, and became vice-president of the Medical Society. He also acted for a time as prosector at the Royal College of Surgeons. After qualification as M.R.C.S. Eng. in 1880 he held several resident appointments at the London Hospital, and then decided to specialise in diseases of the throat. But, after a period as resident medical officer and surgeon to the Throat Hospital, Golden-square, and as physician to the Throat Hospital, Great Portland-street, he abandoned laryngology in favour of obstetrics. In 1883 he took up an appointment as anæsthetist to the Chelsea Hospital for Women, and it was not long before he became private assistant to Dr. Palfrey, one of the fashionable gynæcologists of the time. When Palfrey died, Fenton took over his house in Brook-street and settled down as a practising gynæcologist there, subsequently moving to George-street, Hanover-square. In 1885 he had been elected assistant physician to the Chelsea Hospital, and in 1893 he became full physician. A year or two later the institution was reconstituted, but certain of the members of the old honorary staff were reappointed, and amongst them was Fenton, who was placed on the senior staff, having as his colleagues the late Dr. William Duncan, and Sir John Bland-Sutton. From that time onwards until his retirement by age in 1914 he devoted his best energies to the welfare and advancement of the hospital. "His professional work there," writes Mr. Victor Bonney, "will always be remembered by those who served with or under him, for the conscientious way in which it was carried out, with the result that without ostentation and in the most humble-minded spirit he accomplished a record of surgical achievement of which any man might feel proud. His skill as a diagnostician will perhaps best be remembered by those who worked with him, for he was certainly by far the most brilliant exponent of the art of vaginal examination that the writer has ever met. To posterity he will be known by two surgical instruments whose usefulness has stood the test of time, Fenton's double-ended cervical dilators and Fenton's 'bulldog' volsellum. But he was more than an able gynæcologist; he was a great practitioner. Beyond technical skill he had that wider outlook born of understanding and ready sympathy which raises our calling from science to an art, and few medical men have been so beloved by their patients as he was. His services to Chelsea Hospital for Women were very great, and the more so because they were given most freely at a time when the hospital most needed them. As a colleague he will be held in affectionate remembrance by all of us who had the good fortune to be associated with him. Entirely free from that petty jealousy which too often mars the character of able men, he held the work of his colleagues in generous appreciation. He was always kindly and helpful to every member of the staff from the lowest to the highest, and was exceedingly generous to those under him."

Early in his career, Dr. Fenton joined the Obstetrical Society and the British Gynæcological Society, and of the latter body he became successively secretary and vice-president. He was a keen sportsman, and was especially fond of fishing, which he was able to enjoy until the last year of his life. His wife, who survives him, was the eldest daughter of the late William Foster, of Hornby Castle, Lancaster.

JAMES THOMAS CURRIE LAING, M.B. EDIN., F.R.G.S.

Dr. J. T. C. Laing, who died in London on Sunday, practised in the Portman-square neighbourhood until about a year ago, when his health began to fail. A graduate of the University of Edinburgh, where he took the M.B. degree in 1892, he acted for a time as house surgeon at the Royal Infirmary and as assistant to Prof. Annandale, and then went out to Canada. He took part in the Klondyke gold rush, was appointed assistant surgeon to the Good Samaritan Hospital at Dawson City, and later went to South Africa as medical officer to the Canadian Scouts. Coming to London some twenty years ago, with but few acquaintances and only one or two friends, he built up a large practice by sheer hard work and by the force of his personality. "In his professional life," writes Sir John Thomson-Walker, "his chief characteristics were his wholehearted devotion to his patients regardless of all personal consideration of leisure or fatigue, and his contagious optimism. His influence on the despondent patient was magical, and he was a tower of strength in long-continued chronic illness. Outside his professional work, but without doubt exerting an important influence upon it, he was a great sportsman, a keen golfer, and a steady game-shot, and, in his younger days, a footballer and a formidable boxer. . . . He was a born leader, and would have succeeded wherever responsibilities had to be shouldered or dangers faced. No one knew Jimmy Laing but felt the better for his friendship, and his passing will leave a blank in many lives." During the late war Dr. Laing was physician to the Royal Flying Corps' hospitals in Bryanston-square and Eaton-square, being mentioned in despatches for his services. He was also on the staff of the Princess Christian Hospital

for Officers. Early this year he journeyed to South Africa in an attempt to regain his health, but he found himself unable to continue his work, and spent the summer quietly in Scotland. He leaves a widow with a son and daughter.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

DIPLOMAS IN PUBLIC HEALTH AND IN HYGIENE.

Part II.—Baharsing Jagatsing Ajwani, Manmohan Singh Batra, *Colin Fraser Brockington, Bertha Margaret Butters, Ryder Carrel Dracup, Margaret Ann Glass, Nityaranjan Gupta, *Sethi Indersen, John Leonard Graham Iredale, Girgis Abdel Messih, Jean Hall Morton, *Robert Arthur Welsford Procter, Effie Scott Stephen, Jagan Nath Vasudeva, Dorothy Watterson, Percival Clarence Wickremesinghe, *Kok Cheang Yeo.

* Passed with distinction.

UNIVERSITY OF LIVERPOOL.—At a recent examination the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

Enid Baile, C. A. Birch, Margaret W. Blackwood, R. T. Chadwick, and A. Wahid.

UNIVERSITY OF LONDON: *King's College.*—A course of nine public lectures on the Indebtedness of Industry to Pure Science will be given at King's College, Strand, on Wednesdays at 5.30 P.M., beginning on Oct. 17th, when Sir Oliver Lodge, F.R.S., will give an introductory address. Among the lecturers will be Mr. F. A. P. Aveling, D.Sc., who will speak on the Human Factor (Nov. 7th), and Prof. R. J. S. McDowall, who will speak on Physiology and National Efficiency (Nov. 14th).

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—A course of six lectures, entitled Four Great Philosophers and the Modern Outlook, and dealing with Descartes, Spinoza, Hume, and Kant, will be given by Prof. L. J. Russell at University College, Gower-street, on Tuesdays, at 5.45 P.M., from Oct. 16th onwards. A class giving an Introduction to Philosophy will be held by Mr. S. E. Hooper, the director of studies, on Wednesdays at 6 P.M. at the Royal Anthropological Institute, 52, Upper Bedford-place, London, W.C., in the Michælmas and Lent terms, beginning on Oct. 10th. A lecture on Race and Civilisation will be delivered at the Royal Society of Arts, 18, John-street, Adelphi, W.C., at 8.15 P.M., on Nov. 13th: and one on the Impact of America on Western Civilisation by Mr. S. K. Ratcliffe, at the same hour on Dec. 11th. The temporary offices of the Institute, where information can be obtained, are at 88, Kingsway, W.C. 2.

BRITISH EMPIRE CANCER CAMPAIGN.—Lord Reading presided for the first time as chairman of the Grand Council at its quarterly meeting held on Monday. A vote of sympathy was recorded on the death of Dr. Robert Knox, one of the founders of the campaign and a member of the Grand Council.

The following grants were approved:—£500 as a supplementary grant towards the maintenance of cancer research work being carried out at the Middlesex Hospital; £600 to the Cancer Research Committee of the London Association of the Medical Women's Federation for the salary of its research officer for one year; £200 to Mr. Nevill Willmer, of Manchester University, for the continuation of his research work; £50 to the Clinical Research Committee of Guy's Hospital towards the cost of an investigation on organic compounds of lead with a view to their therapeutic use; and a sum of £1500, spread over a period of three years, to the Middlesex Hospital for the salary of an assistant histologist.

A letter was received from the newly-formed International Cancer Committee, which has been set up to deal with the organisation of international conferences on cancer in future years, and the Grand Council nominated Mr. W. Sampson Handley, Dr. R. G. Canti, and Prof. Archibald Leitch as its representatives on this committee. It was stated that the final report upon the proceedings of the International Conference would be circulated in about three weeks' time.

The Grand Council elected Sir Thomas Horder as its representative on the Scientific Advisory Committee, which is nominated jointly by the Royal Society, the Medical Research Council of the Privy Council, and the campaign itself.

LONG FOX MEMORIAL LECTURE.—This lecture will be delivered by Dr. J. Odery Symes in the physiological lecture theatre of the University of Bristol at 8.30 P.M. on Tuesday, Oct. 30th. His subject will be the Relation of Erythema Nodosum to Tuberculosis and Other Diseases.

GUILD OF ST. LUKE.—The annual festival service of the Guild will be held in Westminster Abbey on Sunday Oct. 21st, at 6.30 P.M. The preacher will be Canon C. S. Woodward, and members of the medical profession are invited to attend, no tickets being required for admission to the service.

ST. GEORGE'S HOSPITAL DINNER.—The annual dinner of St. George's Hospital Medical School was held at the Hyde Park Hotel on the evening of Oct. 1st, with Dr. W. S. Fox in the chair. The Chairman was in his happiest vein when proposing the toast of "The School," and emphasised the many advantages that St. George's offers to the student, especially from the standpoint of individual clinical tuition.—The Dean, Dr. A. Feiling, in his reply, reviewed the work of the past year and drew attention to the high percentage of successes in the examinations of the College of Surgeons.—Sir Crisp English proposed the health of the "Orator of the Day," Sir John Bland-Sutton, who had, in the afternoon, delivered the inaugural address.—Sir John replied in a typically witty speech, which was evidently much appreciated by his auditors.—Later in the evening Mr. Rudyard Kipling recounted, in his inimitable manner, some of his experiences at the hands of the medical profession.

ST. MARY'S HOSPITAL DINNER.—Dr. E. G. Moon took the chair at the annual dinner at the Trocadero Restaurant on Oct. 5th. It was 40 years, he said, since he first attended the hospital dinner, and he thought he had been chosen as chairman because he had eaten more dinner than anyone else. Although St. Mary's Hospital was still young it had high traditions, and he was glad to see that they were being preserved to-day. The buildings, it was true, had somewhat changed, and now the Clarence Memorial wing rose where once Mr. and Mrs. Ed. Moss held out obstinately against all enlargement of the hospital premises. Kings and governments might fall and be forgotten, but he thought that the fame of Mr. and Mrs. Ed. Moss would go on for ever. In their window they had a notice—"Mr. and Mrs. Ed. Moss have left off clothing of every description"; and underneath this appeared the words: "Inspection Invited." To-day the place where their shop stood had become known, through the labours of Sir Almroth Wright and his assistants, throughout the entire world.—Responding to the Chairman's toast of the Hospital and Medical School, Lieut.-Colonel H. E. Verey, deputy chairman of the hospital board, referred to the regretted absence, through ill-health, of Mr. Prideaux, who had been a member of the board for 20 years and its chairman for 11. He also spoke of the death of Mr. Maynard Smith, and testified to his charming personality and invariable courtesy in debate. Last year the hospital had had a balance of about £2500 on the right side, and he saw no reason why with ordinary luck it should not have a balance on the right side again. But the addition of the two new operating theatres and 60 new beds meant an additional expenditure of £7500, and he trusted that all St. Mary's men would do their best to get new annual subscribers. The medical school needed rebuilding, a new nurses' home was wanted, and the hospital ought to have "pay beds"—the most crying need in London to-day.—Dr. C. M. Wilson, replying to the toast as Dean, said that the entry of students to the school was, as last year, in the middle 'forties. New buildings would cost £160,000, and this was a vast sum to get from the public, which was alleged to be apathetic to medical education. Nevertheless, the sum of £60,000 had been collected from this same public during a few weeks in the summer, largely owing to the enthusiasm of the pathological department led by Dr. John Matthews. He pleaded for more money; at the same time it must be remembered that the virtue of the institution lay not in the buildings, or even in the staff, but in the students.—The toast of "The Chairman" was proposed by Mr. V. Warren Low. When last he proposed this toast at one of these dinners, he said, the chairman in question had soon afterwards been made Governor of Queensland, and he would be sorry if anything he said should have a similar effect on Dr. Moon. As a physician, Dr. Moon displayed a wonderful clinical instinct and the soundest of common sense. In his work at schools he looked after hundreds of children whose parents had made a life-long study of medicine, and in this connexion Mr. Low was reminded of the saying, "The more I see of the average parent, the more I respect the average boy." In short, said Mr. Low, the chairman was a big man with a big mind, a big heart, and a very genial humour.—The toast was drunk with acclamation, and Dr. Moon briefly replied.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—A cheerful company celebrated, at the Hotel Victoria, on Oct. 3rd, the sixtieth anniversary of the passing of the Pharmacy Act, which, as the president aptly remarked, drew together chemists and druggists with members of the Society and established unity in pharmacy.—Sir Gregory Foster, who proposed the toast of the Pharmaceutical Society of Great Britain and its Benevolent Fund, commented, as Vice-Chancellor of the University of London, on the improvement in quality and calibre of the men and women entering for courses in pharmacy in the various schools, of which there were now no less than 25 connected with the Universities of London, Manchester, and Glasgow. In pleading for support for the benevolent fund, he pointed out that the calls made on this fund would be considerably reduced by the establishment of adequate superannuation funds for employees.—The President, Mr. Herbert Skinner, in his response, said that for 60 years the Society had been the authority for administering the poisons law of the country, and had carried out this duty fairly and loyally with the sole view of the protection of the public. The National Health Insurance Act of 1911 had made pharmacists dispensers to the nation. Under that Act sixty million prescriptions were dispensed annually. The Benevolent Fund was established in 1841; since then £250,000 had been subscribed and £180,000 disbursed. He asked for an additional £5000 to be collected during his year of office by the 114 branches of the Society throughout the country.—Mr. E. T. Neathercoat, proposing the Houses of Parliament, deplored the absence of any pharmacist among the members of this Parliament. It was hoped to remedy this defect. The tendency nowadays was to frame Acts in skeleton only, leaving the rest to be added by departmental regulations and Orders in Council. This was a departure from the practice current 60 years ago, and might or might not be a useful one. Any suggestion that the Pharmaceutical Society was out of date or no longer useful was refuted by its record of public service during the last 60 years.—Sir Geoffrey Butler replied, and Mr. L. Moreton Parry, the vice-president of the Society, proposed the health of the guests, who, apart from the speakers, included Prof. W. E. Dixon, Sir William Willcox, Surgeon Vice-Admiral Gaskell, Sir Wilfrid Sugden, M.P., Mr. Colin Smith, and Sir Arthur Robinson, the last of whom responded. He pointed out that the Pharmaceutical Society of Great Britain was one of the earliest examples of that self-government which had now been granted to dentists and nurses, and was being demanded by opticians, herbalists, and morticians. Sir Arthur Robinson endorsed what had been said as to the general level of performance by the members of the pharmaceutical profession under the National Health Insurance Act, and praised the enterprise which had led the Society to provide a laboratory and devise tests for biological substances coming under the Therapeutic Substances Act. He wished to add a word about the Retail Pharmacists Union, of which union doubtless many of those present were members. This union had performed successfully a very difficult act of statesmanship, and by their willing coöperation its members had become partners in a great national service.

DONATIONS AND BEQUESTS.—Mr. T. N. Macaulay, of Montrehall, President of the Sun Life Assurance Company of Canada, has contributed £8000 for endowment to the Lewis Hospital, Stornoway.—Croydon General Hospital has received £7500 from Mrs. Heath Clark out of the portion of the late Mr. Charles Heath Clark's estate set aside for charitable purposes.—Sir Louis F. Beeston, of Nottinghamshire, has given £5000 to the Nottinghamshire General Hospital for a new operating theatre.—Mr. James Walker Oxley, of Spenfield, Westwood, Leeds, banker, left £5000 4 per cent. Preference stock of the London Midland and Scottish Railway (value to-day about £3225) each to the Leeds Public Dispensary, the Leeds District Nursing Fund for the Sick Poor, and the Leeds Tradesmen's Benevolent Institution, in each case as a permanent endowment to be called the "James W. Oxley Bequest."—The Bolton Infirmary will benefit to the extent of £10,000 under the will of Mr. Colin Cooper, of Bolton and Manchester, accountant. The gift will be used in connexion with the proposed extension of the accommodation for patients.—Miss Fanny Dyke, of Caversham, Oxford, left £1000 to the Royal Berks Hospital to endow a bed.—Sir Henry Whitehead, of Hawkswood, near Baildon, Yorks, wool merchant, left among other bequests £10,000 to the Bradford Royal Infirmary, in addition to £10,000 given this year, and £10,000 each to the Bradford Royal Eye and Ear Hospital and the Bradford Children's Hospital. After personal and family legacies the residue of the property he left to the executors upon trust to pay at their discretion a sum not exceeding £20,000 for charitable objects in the City of Bradford to which he had not bequeathed a legacy, and the ultimate residue as the executors may determine for such charitable institutions in the West Riding of Yorkshire, recommending them to consider first the benefit of persons who through blindness or other infirmity are least able to help themselves.—Mr. William Thomas Brand, of Eaton-place, S.W., after legacies to his daughter and other relations bequeathed £250 each to St. George's Hospital, Guy's Hospital, the London Hospital, and the Freemasons' Hospital in Fulham-road. The residue to his daughter for life, and, subject thereto, £2000 each to the National Lifeboat Institution, St. George's Hospital, the London Hospital, and the Freemasons' Hospital; and the ultimate residue, after other bequests, equally between St. George's Hospital, Guy's Hospital, the London Hospital, the Freemasons' Hospital, the Middlesex Hospital, and the Westminster Hospital.—Mr. William Ernest Wimpenny, of Edgerton, Huddersfield, left among other bequests £1000 to the Huddersfield Royal Infirmary.

POST-GRADUATE COURSES IN NEUROLOGY.—A comprehensive series of neurological lectures and demonstrations is now beginning at the National Hospital, Queen-square, London, W.C. Details may be had from Dr. J. G. Greenfield, Dean of the Medical School.

MUNICIPAL MATERNITY HOME AT OLDHAM.—The corporation of Oldham has opened its first municipal maternity home, which is situated at Greenacres. It cost £9500, and will accommodate 12 patients, the charges being kept within the range of working people.

CREWE MEMORIAL COTTAGE HOSPITAL.—Princess Mary has opened an extension of this institution which has cost £20,000. The additions include a new 20-bed ward for men, a private ward, a new administrative block, X ray and ultra-violet ray departments, and improved accommodation for the staff. There are now, in all, 60 beds.

POST-GRADUATE TEACHING IN GLASGOW.—The programme of post-graduate classes in Glasgow from November to May has now been issued and may be had of the secretary of the Post-Graduate Association, at 9, Woodside-terrace, C. 3. Weekly demonstations and special courses are to be given, and clinical assistantships are available for those who wish to make a detailed study of a specialty.

CONGRESS OF BALNEOLOGY.—The forty-fourth congress of the German Balneological Society will be held at Berlin under the chairmanship of Prof. Dietrich from Jan. 25th to 27th. This will mark the jubilee, the society having been founded in 1878, with its first congress in 1879. Particulars of the meeting may be had from the general secretary of the Society at Fraunshoferstrasse 16, Charlottenburg.

UNIVERSITY OF BRISTOL: *Association of Alumni* (*London Branch*).—The seventh annual dinner will be held on Nov. 2nd, at 7.30 for 7.45 P.M., at the English Speaking Union Club, Dartmouth House, Charles-street, Berkeley-square, London, W. Mr. Stanley H. Badock, Pro-Chancellor of the University of Bristol, will preside, and Sir George Oatley will be the guest of the evening. The hon. secretary of the branch is Dr. Elizabeth Casson, Holloway Sanatorium, Virginia Water, from whom tickets may be obtained.

EXTENSION OF THE RADCLIFFE INFIRMARY.—An appeal is being made for £120,000 for the enlargement of the Radcliffe Infirmary at Oxford. Mr. W. R. Morris, the president, who had already promised £40,000 for the provision of a new maternity department, has undertaken to give a further £40,000 on condition that the remaining £80,000 is raised by the appeal. The needs of the hospital are four new ward blocks, a new nurses' home, new operating theatres, a new electrical and massage department, increased accommodation for out-patients, a new laundry, and enlarged offices. During the last ten years the work of the institution has increased 50 per cent., and the weekly contribution scheme, which in 1920 produced £836, last year yielded over £28,000, and is still growing.

COMBINED YORKSHIRE ASSOCIATIONS OF SCOTTISH GRADUATES.—A dinner of this Association will be held at the Queen's Hotel, Leeds, on Friday, Oct. 19th, at 7 P.M. The guests of the evening will be the three Parliamentary representatives of the Scottish Universities, Sir George Berry, Mr. John Buchan, and Mr. J. M. Cowan. The chair will be taken by Mr. J. B. Baillie, Vice-Chancellor of Leeds University. All graduates of these Universities resident in Yorkshire, whether members of the various Associations or not, are invited to attend and to bring guests (including ladies) if they so wish. Tickets and any further information may be obtained from the Honorary Secretary of the Combined Dinner, Dr. William MacAdam, 40, Park-square, Leeds.

Dr. Lawrence Price has accepted an invitation to to become Mayor of Nuneaton for the coming year.

CONFERENCE ON LIGHT AND HEAT IN THERAPY.—The second International Conference on Light and Heat in Medicine, Surgery, and Public Health is to be held in the house of the University of London, South Kensington, from Monday, Oct. 29th, to Thursday, Nov. 1st. The programme now issued indicates that many different aspects of the subject will be covered. Papers will deal with the use of light therapy in specific conditions—e.g., surgical tuberculosis (Sir Henry Gauvain), pulmonary tuberculosis (M. Weinbren), skin affections (W. J. O'Donovan), dental caries (F. Talbot); others with new methods and apparatus, and with the physical characteristics of equipment—e.g., a general consideration of ultra-violet apparatus (W. K. Russell), new electrotherapeutic apparatus (C. B. Heald), and the efficiency of various ultra-violet light producers (T. C. Angus); others again with photosensitisation (A. Eidinow), and plant pigments in relation to it (C. C. Morrell). Among the distinguished foreign visitors who will read papers will be Dr. A. J. Cemach, of Vienna (Ultra-violet therapy in oto-rhino-laryngology), Dr. Franz Nagelschmidt, of Berlin (A new method of applying heat by diathermy and Foam treatment), Dr. Wm. Flaskamp, of Prof. Wintz's clinic at Erlangen (Light and heat in gynæcology), and Dr. M. J. Dorcas, of Cleveland, U.S.A. (Distribution of energy from various types of arcs). All medical men are invited to attend and participate in the discussions. The conference is organised by the *British Journal of Actinotherapy*, 17, Featherstone-buildings, London, W.C. 1, from whom invitation cards, programmes, and vouchers for reduced rail fare may be obtained on application. An exhibition of apparatus, accessories, and adjuvants for light and heat therapy will be held in halls adjoining the conference room. The exhibition, which will remain open from 2.30 to 9.30 P.M. each day (last day, 6 P.M.), will be formally opened at 2.30 P.M. on Monday by Sir John Snell, chairman of the Electricity Commissioners, with Lieut.-Colonel F. E. Fremantle in the chair. Demonstrations will be given on the irradiation of milk and the detection of ringworm by the U.-V. lamp.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 29TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 94 (last week, 113); scarlet fever, 2329 (last week, 2097); diphtheria, 1228; enteric fever, 74 (last week, 88); pneumonia, 769; puerperal fever, 33; puerperal pyrexia, 112; cerebro-spinal fever, 6; acute polio-myelitis, 13; acute polio-encephalitis, 3; encephalitis lethargica, 18; dysentery, 14; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week. The return for enteric fever includes 20 cases of paratyphoid fever, of which 12 were notified in London.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 2nd–3rd was as follows:—Small-pox, under treatment, 16; scarlet fever, 1925; diphtheria, 1534; enteric fever, 63; measles, 68; whooping-cough, 254; puerperal fever, 20 (plus 15 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 16. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 3 (0) from enteric fever, 5 (0) from measles, 3 (3) from scarlet fever, 21 (4) from whooping-cough, 28 (5) from diphtheria, 160 (36) from diarrhœa and enteritis under two years, and 33 (4) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever were reported from Southampton, Wallasey, and Middlesbrough. One fatal case of measles was reported from Wolverhampton. 1 from Birmingham, 1 from Manchester, and 2 from Liverpool, whilst 6 were reported from Belfast. Liverpool reported 3 fatal cases of whooping-cough and Salford reported 2. The number of deaths from diarrhœa and enteritis continued to increase; Liverpool reported 18, Newcastle-on-Tyne 9, Manchester, Leeds, and Birmingham 7, and Wolverhampton, Leicester, Nottingham, and Cardiff 5 each.

The number of stillbirths registered during the week in the great towns was 273 (corresponding to a rate of 43 per 1000 births) including 52 in London.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 16th.—5.30 P.M., General Meeting of Fellows and Ballot for election to the Fellowship. 8.30 P.M.: PATHOLOGY. Presidential Address: Prof. A. E. Boycott: The Transition from Live to Dead: the Nature of Filtrable Viruses.

THURSDAY.—5 P.M. (Cases at 4 P.M.): DERMATOLOGY. Dr. H. W. Barber: (1) A Case of White Spot Disease. (2) Raynaud's Disease with Calcareous Nodules. (3) Confluent Lichen Nitidus. Dr. J. E. M. Wigley: Two Cases of Acne Agminata (with sections). Other cases will also be shown.

FRIDAY.—8 P.M.: OBSTETRICS. Specimen: Mr. A. C. Palmer, Carcinoma of the Vagina in a Patient aged 24. Introductory Address by the President, Dr. J. S. Fairbairn. Paper: Dr. Dougal Bissell (New York): Genito-urinary Fistula in the Female, with an appreciation of Sims and his work. 8.30 P.M.: ELECTRO-THERAPEUTICS. Presidential Address: Dr. J. E. A. Lynham: Some Difficulties in Radiation Therapy.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Oct. 17th.—3.30 P.M.: Dr. C. S. Thomson: The Causes, Symptoms, and Prevention of Nervous Breakdown.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

MONDAY, Oct. 15th.—At Buxton. Discussion: Rheumatism as a National Problem; the Clinic for Rheumatism.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, Oct. 18th.—Preceded at 7.45 P.M. by an Exhibit of Surgical Armamentaria of Ancient and Modern India (from the Wellcome Historical Medical Museum). 8.15 P.M.: Lieut-Colonel Sir Frank Powell Connor: The Surgical Aspects of Tropical Diseases, with some Remarks on the Conditions under which Surgery is Practised in the Tropics.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL.

WEDNESDAY, Oct. 17th.—8 P.M., at Essex Hall, Strand. Dr. M. Beddow Bayly: Voronoff and His Rejuvenation Experiments.

TUBERCULOSIS ASSOCIATION.

WEDNESDAY, Oct. 17th.—At the House of the Royal Society of Medicine, 1, Wimpole-street, W. 5.30 P.M.: Prof. R. H. Plimmer: Recent Work on Vitamins. 8 P.M.: Discussion on Artificial Pneumothorax Treatment from Different Aspects.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Oct. 15th.—5 P.M., Sir Arthur Keith: Problems in Human Anatomy which arise out of the identification of a skull attributed to Lord Darnley.—Demonstration, illustrated by specimens.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 15th, to SATURDAY, Oct. 20th.—FELLOWSHIP OF MEDICINE, Medical Society of London, 11, Cavendish-square, W. Mon., 5 P.M.: Lecture by Mr. C. Max Page on Some Points in the Treatment of Fractures.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Intensive course.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Second week of special course in Gynæcology.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Special morning course.—HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. Wed.: special clinical demonstration by Mr. Jefferson Faulder at 3 P.M. No Fee.—ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C. Wed., 4 P.M. Special demonstration by Dr. G. B. Dowling. No fee.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M. Dr. S. H. Daukes: The Transmission of Helminthic Diseases. Free.
Further particulars from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 15th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (Demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 4.30 P.M. (Special Lecture) Dr. Scott Pinchin: Cardiac Irregularities.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department. 4.30 P.M. (Special Lecture): Mr. Tyrrell Gray: Gastric and Duodenal Ulcer.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat. Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.
Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Oct. 15th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Oct. 16th.—5 P.M.: Dr. H. W. Barber: Bacteriology and Mycology.
THURSDAY.—5 P.M.: Dr. I. Muende: Pathology Demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 18th.—4 P.M.: Mr. Barrington-Ward: Chronic Intestinal Obstruction.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Oct. 16th.—3.15 P.M.: Dr. H. C. Semon: Fungus Infections of the Hands and Feet.

UNIVERSITY COLLEGE, Gower-street, W.C.
MONDAY, Oct. 15th.—5 P.M.: Prof. E. B. Verney: Urinary Secretion. (First of six lectures).
FRIDAY.—5 P.M.: Prof. J. C. Drummond: Recent Work on Vitamins (Second Lecture).

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Oct. 17th.—4 P.M.: Dr. Graham Little: The Health of the Medical Practitioner.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Oct. 16th.—4.15 P.M.: Dr. F. E. Tylecote: Asthma: Recent Research and the Work of the Asthma Research Council.
FRIDAY.—4.15 P.M.: Dr. D. P. Sutherland: Some Complications of Pulmonary Tuberculosis and Their Treatment.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.
THURSDAY, Oct. 18th.—3.45 P.M., Dr. W. J. S. Reid: Diseases of Sympathetic Nervous System.

Appointments.

ALDERSON, C. R., L.R.C.P.Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Eastbourne District.
EATON, A. H. M., M.B., B.Ch. Belf., Surgeon to the Tyrone County Hospital.
TAYLOR, John F., M.D., B.Chir. Camb., Pathologist, Lecturer in Pathology and Curator of the Museum, St. George's Hospital.

Vacancies.

For further information refer to the advertisement columns.
Bethlem Hospital, Lambeth-road, S.E.—Two H.P.'s. Each £25 per quarter.
Blackburn Institution and Infirmary.—Res. Asst. M.O. £200.
Bradford Royal Infirmary.—H.S. and H.P. Each £150.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
Burnley County Borough.—Asst. M.O.H., &c. £600.
Bury County Borough.—Asst. M.O.H., &c. £600.
Carlisle, Cumberland and Westmorland Mental Hospital.—Deputy Med. Supt. £500.
Chelmsford, Essex and Colchester Mental Hospitals.—Pathologist. £800.
Chester Royal Infirmary.—Honorary Surgeon.
Chesterfield and North Derbyshire Royal Hospital.—Cas. H.S. At rate of £100.
Dunedin, New Zealand, Otago University.—Professor of Pathology. £1000.
East London Hospital for Children, &c., Shadwell, E.—H.S. At rate of £125.
Elizabeth Garrett Anderson Hospital, Euston-road.—Ophthalmic S. Also Asst. S. to Throat, Nose and Ear Dept.
Essex County Council.—Male Asst. Tub. O. £700.
Halifax, Royal Halifax Infirmary.—3rd H.S. At rate of £100.
Hertford County Hospital.—H.P. At rate of £150.
Hull Royal Infirmary.—Asst. H.P. At rate of £130.
King's College Hospital, Denmark-hill, S.E.—Jun. Neurologist.
National Hospital, Queen-square, W.C.—Registrar. £200.
Northampton General Hospital.—Hon. Dental Surgeon.
Portsmouth, St. Mary's Infirmary, Institution, &c.—Third Asst. Res. M.O. £250.
Norwich, Jenny Lind Hospital for Children.—Res. M.O. At rate of £150.
Oswestry, Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home.—H.S. £200.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Rochester, St. Bartholomew's Hospital.—Third Res. M.O. At rate of £175.
Royal Dental Hospital of London, Leicester-square, W.C.—Hon. Med. Officer to Electro-Therapeutic Dept.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Res. H.S. and Asst. H.S.
Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £150.
Royal Northern Hospital, Holloway, N.—Anæsthetist. £10 10s.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Luke's Hospital, Cale-street, Chelsea, S.W.—1st Asst. M.O. £400.
St. Thomas's Hospital, S.E.—Asst. Pathologist. £450.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Reg. £100.
Sheffield University.—Asst. Bacteriologist. £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Shanghai Municipal Council.—P.H. Dept. Asst. Radiologist. 700 Taels a month.
Southampton, Royal South Hants and Southampton Hospital.—H.P. £130.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Hon. Asst. S. to Ophth. and Aural Department. £100.
Wolverhampton and Staffordshire Hospital.—Cas. O. and Anæsthetist. At rate of £125.
Wolverhampton, Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Chief Inspector of Factories announces vacant appointments for Certifying Surgeons at Crewe (Cheshire) and Thornbury (Gloucestershire).

Births, Marriages, and Deaths.

BIRTHS.

MCCREDIE.—On Oct. 2nd, at Academy-street, Stranraer, the wife of Peter A. McCredie, M.B., Ch.B., F.R.C.S., of a daughter.

MARRIAGES.

BURN—PEMBERTON.—On Oct. 4th, at St. George's, Bloomsbury, J. Harold Burn, M.D. (Camb.), to Katharine Frances, youngest daughter of the Rev. Robert and Mrs. Pemberton, of Ingatestone, Essex.
COLLIE—ARROL.—On Oct. 1st, at St. Andrew's Presbyterian Church, Frognal, London, Sir John Collie, C.M.G., M.D., to Lady Arrol, widow of Sir William Arrol.
MITCHINER—PHILPOTT.—On Oct. 6th, at the Chapel Royal, Hampton Court Palace, Philip Henry Mitchiner, M.D., M.S., F.R.C.S., eldest son of Mr. and Mrs. Mitchiner, of Redhill, to Margaret, only daughter of Mr. Basil H. Philpott, M.V.O., and the late Mrs. Philpott, of Surbiton.
OGIER WARD—JONES.—On Oct. 5th, 1928, at St. Marylebone Church, Ronald, only son of Dr. and Mrs. Allan Ogier Ward, of Addlestone, to Elsie Antoinette, daughter of David and Mrs. Jones, of Llandilo.
WALSH—HARLEY.—On Oct. 6th, at the Church of Our Lady and St. Thomas of Canterbury, Harrow-on-the-Hill, Hugh Paul Walsh, M.B., to Sheila Patricia, only daughter of Dr. and Mrs. H. R. Harley, of Harrow.

DEATHS.

FENTON.—On Oct. 5th, at Litley Court, Hereford, after a long illness, William Hugh Fenton, M.D., in his 74th year.
LAING.—On Oct. 7th at Montagu-street, London, J. T. C. Laing, M.B., C.M., F.R.G.S., aged 57.
REED.—On Oct. 6th, suddenly at Exmouth, William Cash Reed, M.D., in his 78th year.
RUTHERFURD.—On Oct. 2nd, at a sanatorium, James Edmund Rutherfurd, M.D., M.C., late Captain R.A.M.C., aged 52.
SPENCE.—On Oct. 1st, at St. Matthew's-road, St. Leonards-on-Sea, James Beveridge Spence, M.D., O.B.E., for 43 years Medical Superintendent of the County Mental Hospital, Burntwood, Lichfield, aged 79.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

OBSERVATIONS ON THE SELECTION AND STANDARDISATION OF SURGICAL INSTRUMENTS.

By A. H. Tubby, C.B., C.M.G., M.S. Lond.,
CONSULTING SURGEON, WESTMINSTER HOSPITAL.

II.*—On the Use of Stainless Steel.

The introduction of stainless steel has revolutionised many industries, and its practical value as a labour-saving device is exceedingly great. If it were employed in the manufacture of surgical, orthopædic, dental, and veterinary instruments it would effect a great economy of time, labour, and expense, because it does not rust or tarnish; it retains its brightness when exposed to most, if not all, the agents used in surgical work, and it saves the cost of frequent re-nickelling. Its essential feature is the large percentage of chromium in its composition. A comparative table of percentage compositions will show at once the differences between stainless and shear carbon-steel.

—	Carbon	Manganese	Silica	Sulphur	Phosphorus.	Chromium
Carbon shear steel	0·8 to 0·95	0·05	0·07	0·01	0·01	Nil.
Stainless steel	0·3	0·3	0·12	0·02	0·02	13

The Hardening of Stainless Steel.

The cutting properties of a knife made from shear carbon-steel depend chiefly upon the hardening and the method of tempering. Dr. Hatfield remarks that if "a knife is too hard, obviously it is because it has not been sufficiently tempered. If it is too soft, it is because either (1) it has not been properly hardened, or (2) it has been over-tempered, always provided the steel is of correct composition. Stainless steel may be hardened in air or water and tempered to various degrees of hardness as required for the purposes for which it is intended. Whereas carbon tool-steel is hardened at temperatures from 760° to 780° C. for the maximum hardness to be obtained, with stainless steel the temperature for effective hardening is higher, and it is recommended that temperatures between 950° and 1000° be used. These temperatures must be registered very precisely by a thermo-electric pyrometer."

Roughly, however, carbon-steel is hardened at a red heat and stainless steel at an orange yellow, when it forms a "solid solution" of its constituents just as carbon steel does. It is the discovery of this essential fact, made in the Brown-Firth Research Laboratory at Sheffield, which has rendered the practical use of stainless steel possible for cutting and many other purposes.

In making stainless steel knives quenching should, according to Dr. Hatfield, always be done in water, as with ordinary steel knives. In heating for hardening, the bolster and tang of the knife should not be heated to the hardening temperature, but kept as cool as possible. This is especially important with stainless knives.

Tempering, Annealing, and Grinding Stainless Steel.

Stainless steel knives can be satisfactorily tempered, after quenching, by placing them in an oil bath between 100° to 150° for five minutes.

Some instruments must be softer than knives, and this result is obtained by partially annealing or softening. On this point Dr. Hatfield writes as follows: "If stainless steel is cooled in air from the hardening temperature, then it is very hard. If it is to be softened, it should be kept at the temperature approximating to that commonly employed for hardening shear carbon-steel blades (750°–760° C. is the best). After maintaining this temperature for a sufficient length of time, always to be determined by one's own experience, the knives can then be quenched in water and will be serviceable for any of the operations where the soft and ductile condition is required."

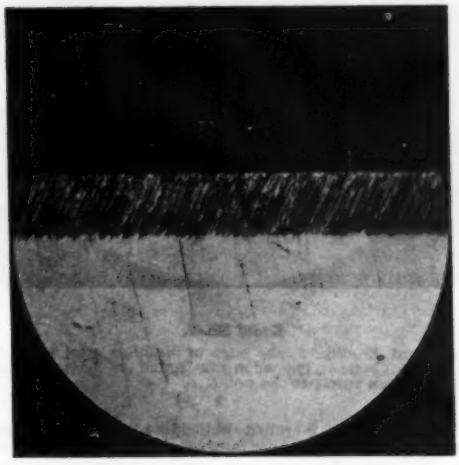
Grinding is a very important item and should be done very carefully, or otherwise considerable heat is developed, quite sufficient to soften unduly the edge of a knife or other cutting instrument.

* Part I. appeared last week.

Effects of Various Reagents on Stainless Steel.

Dr. W. H. Hatfield and his colleagues have made numerous experiments at the Brown-Firth Research Laboratories, and the results are set forth in a small volume entitled "The Development of Stainless Steel: Its Properties and Uses." Their tests included exposure to acids of many kinds, alcohol and alcoholic fluids, alkaline reagents, gases, and many components of cookery. The steel has come out triumphantly. It appeared to me, however, that before the use of stainless steel for surgical and dental purposes is advocated it should be subjected to experimental investigation of the effects on it of the processes involved in sterilisation; and that the results of the exposure of the steel to various antiseptic substances used in surgical procedures should be ascertained. I accordingly drew up a scheme of experiments on stainless steel with especial reference to surgical work, and sent it to Dr. Hatfield, who kindly undertook the experiments. The report of his results is given in full.

Fig. 1.



Knife No. 1.

Fig. 1.—The edge of stainless steel knife No. 1 (× 100 and hardness 540), after being used twice on soft tissues and not re-sharpened. The edge of the knife is seen to be in excellent order along its whole length.

Cylinders of stainless F.H. steel (stainless cutlery steel used for the manufacture of stainless knives); stainless F.G. steel (high tensile stainless steel, complying with the mechanical properties required for specific engineering purposes); stainless F.M. steel (malleable stainless steel prepared for cold pressing and for other purposes where the rust-resisting property is desirable in conjunction with considerable toughness), and F.I. (stainless iron), polished to 000 emery paper, were placed in the following media for the periods stated:—

1. Prolonged boiling, up to 20 minutes in tap water to which about one teaspoonful of sodium bicarbonate to the pint had been added—the surface was unaffected.

2. Immersed in absolute alcohol for half an hour—all samples unaffected.

3. and 4. Immersed in "ordinary trade" methylated spirits for one hour, also in rectified spirit for one hour—all samples unaffected.

5. and 6. Immersed in pure lysol, also in 1 in 40 lysol solution each for one hour—all samples unaffected.

7. Immersed in pure carbolic acid for one hour—all samples unaffected.

8. and 9. Immersed in 1 in 20 and 1 in 40 carbolic solution each for two hours—all samples unaffected.

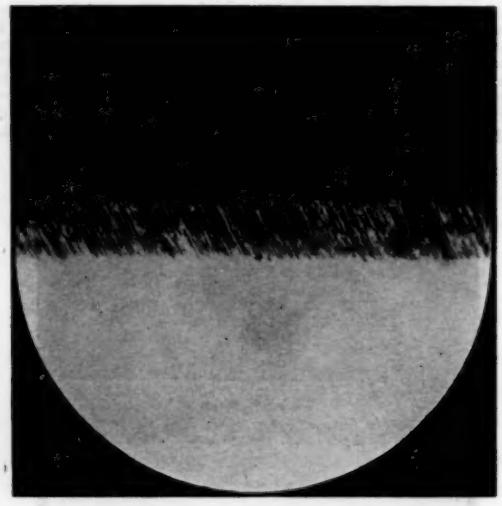
10 to 13. Immersed in mercuric iodide solutions 1 in 2000, 1 in 3000, 1 in 4000, and 1 in 5000 for two hours—all samples unaffected.

14, 15, 16, and 17. Immersed in mercuric cyanide solutions 1 in 2000, 1 in 3000, 1 in 4000, and in 5000, each for two hours—all samples unaffected.

18. Immersed in mercuric chloride solution 1 in 2000 for two hours—whitish spots appeared on the cylinders, most marked in F.H. (qv); practically none on F.M. F.H. (loss in grammes per sq. cm. of surface area = 0·0001; F.G. = 0·0001; F.M., nil; F.I. = 0·001.

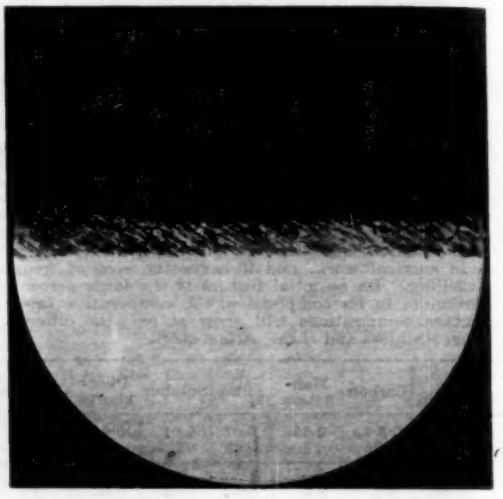
19. Immersed in mercuric chloride solution (1 in 3000) for two hours, loss of F.G. = 0·0001 and of F.H. = 0·0001; spotting similar to that of No. 18, but less marked. F.M. loss = nil and F.I. loss = nil; practically unaffected.

FIG. 2.



Knife No. 2.

FIG. 3.



x

Knife No. 2.

FIGS. 2 and 3.—Fig. 2, the edge of stainless steel knife No. 2 (× 100 and hardness 567) after use in two consecutive operations on bone. The edge was found to be good nearly up to the point, but as seen in Fig. 3 (x) there is a slight indentation towards the point.

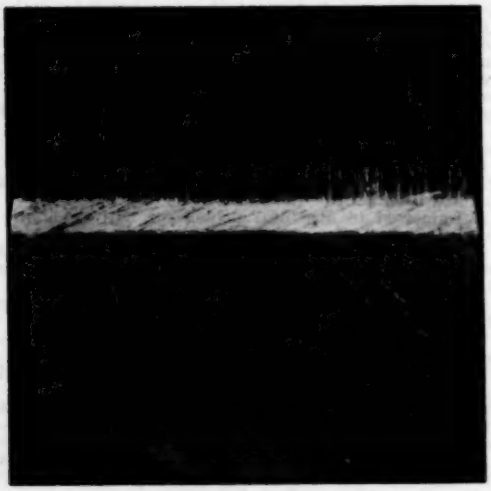
20. Immersed in mercuric chloride solution (1 in 4000) for two hours. Only the faintest indications of whitish spots. F.M. and F.I. were practically unaffected.

21. Immersed in mercuric chloride solution (1 in 5000) for two hours. No visible effect on any of the types of stainless steel.

22. Immersed in 0·6 per cent. sodium chloride solution for three days. All samples unaffected.

This series of experiments shows that not one of the processes or reagents had any effect upon stainless steel except mercuric chloride solution, and that only in 1 in 2000, 1 in 3000, and 1 in 4000 solutions after two hours' exposure, which may be considered a reasonable length of time for an intricate surgical operation.

FIG. 4.



Knife No. 3.

FIG. 4.—The edge of stainless steel knife No. 3 (× 100 and hardness 515), which was used twice in operations on bone in an adult. The edge generally was found to be in a very good condition, but there were a few indentations.

23. The reaction of stainless steel to iodine has been the subject of another series of tests made at my suggestion by Dr. Hatfield and his colleagues. Stainless steel samples were immersed in an aqueous solution of iodine to which potassium iodide had been added. The solutions had the following strengths :—

1. 1·27 g. iodine and 5 g. KI. per litre.
2. 12·7 g. „ 5 g. „

The samples were immersed to half their height, and after seven days' immersion there was no attack visible on the portion immersed, but the surface above the solution was badly corroded in each case. It would seem to be the iodine vapour, and not the iodine solution, which has the corrosive effect.

We are not likely to expose instruments for seven days to iodine solution, and we do not use it as a means of sterilising or cleansing our instruments.

24. Boric acid in 50 per cent. and 5 per cent. solutions has no effect after seven days, and

25. Acetone only after several days, not under 14.

26. Cow's and sheep's blood is totally without effect even after 14 days.

27. Novocaine is largely used in dental practice, chiefly as an injection. In order to test the suitability of stainless steel for injection needles, they were placed in the following solutions :—

1 grain of novocaine in 5 c.cm. of water.
1 grain „ „ absolute alcohol.

At the end of seven days a slight film of rust had formed on both samples. This was completely removed by washing, leaving the surface quite unaffected, with the exception of a slight corrosion at the point of support of the sample in the aqueous solution.

28. The contact of two metals in the presence of an electrolyte often causes pitting, corrosion, and other changes, and stainless steel is not an exception.

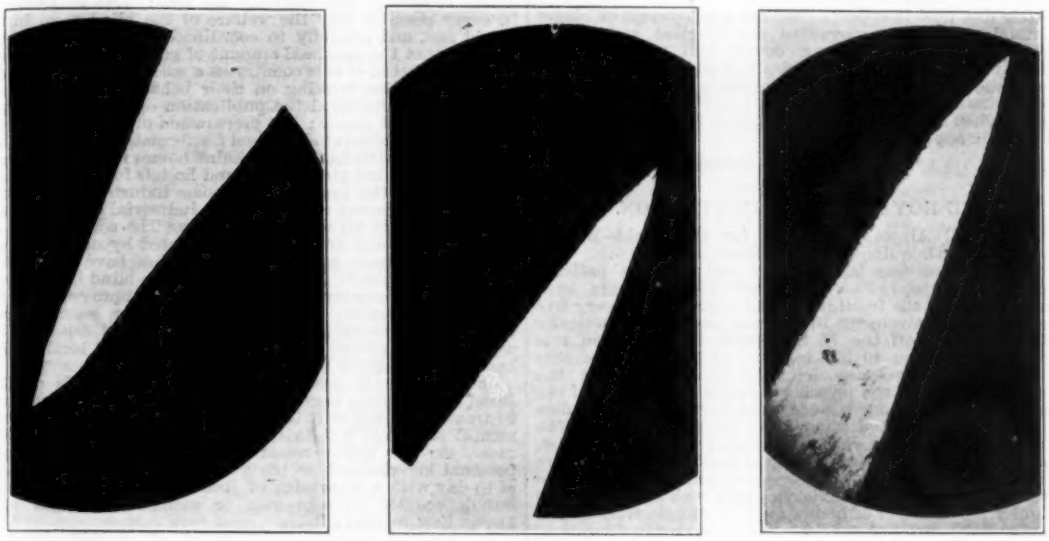
29. Formaldehyde or formalin is occasionally used for surgical purposes and more often for dental procedure. It is interesting to note that after seven days 50 per cent. and 5 per cent. solutions of formic acid cause considerable corrosion of stainless steel.

Stainless Steel Knives.

The usual comment is: "We know they do not stain nor rust, but they are blunt and will not cut, and what is

worse they cannot be sharpened."† Experiments and investigations have clearly proved that if such knives are properly manufactured they are equal to any other cutlery in cutting properties; further, that for surgical purposes they are quite as good as the ordinary carbon steel knife, except when unusual hardness is required. If stainless steel knives are hardened at 950–1000° C. and are tempered in an oil bath at 180° C. for five minutes, they attain a hardening index quite sufficient for all ordinary purposes and are available for surgical work.

Fig. 5. Fig. 6. Fig. 7.



Knife No. 1. Knife No. 2. Knife No. 3.

Figs. 5, 6, and 7 (× 100).—The blade-angles of stainless steel knives 1, 2, and 3 respectively. The distinctions between the angles of the blades, 16°, 16°, and 13° respectively, and the cutting angles, 40°, 36°, and 35°, are well seen.

Dr. Hatfield kindly had made for me three surgical knives of stainless steel, and I submitted them to the tests of operation. Knife No. 1 was used for two operations on soft tissues only, and did not come into contact with bone. It was placed twice in methylated spirit for ten minutes and was employed for two consecutive operations: (1) For the removal of a large nævus from a small child; (2) to incise the inflamed soft tissues of an adult. Knives Nos. 2 and 3 were used for operations involving the removal of bone from an adult. The periosteum was divided and dissected from the affected area and the edge of the knife was firmly pressed against the bone. Care was taken not to spare the cutting edge of the knives, all of which were made from the same bar of stainless steel. Dr. Hatfield reported upon the knives after being used as described:—

Examination of Edges.—Knife No. 1: After being twice used on soft tissues and not re-sharpened, the edge of the knife was found to be excellent along its whole length, as shown when magnified by 100 diameters (see Fig. 1). Knife No. 2: This was found to be very good up to the spot as shown in Fig. 2, but towards the point of the knife there was a slight indentation of the knife as shown in Fig. 3. Knife No. 3: The edge was found to be in a very good condition, but there were a few small indentations as shown in Fig. 4

Hardness Test.—After being used for operating each knife was examined and the Brinell hardness value was determined. The result of the tests being as follows:—

No.	Blade.	Haft.	No.	Blade.	Haft.	No.	Blade.	Haft.
1	540	230	2	567	—	3	515	246

Thus showing that if made of stainless steel of proper composition, hardening and tempering, blades with a hardness of 515–565 are sufficiently sharp and durable for surgical work, and that they fulfil the requirements of ordinary wear and tear in practice. For the very highest type of surgical knife, such as those used in cataract operations, I should, however, always prefer a knife made from shear carbon-steel, because the keenest possible edge can be obtained with this material.

Blade Angles.—There are two angles to be considered in each blade, the first being the angle formed on the blade as a whole and the second the cutting angle ground on the edge of the blade; the latter being the actual cutting angle of the knife. The angle of the blade of the three knives was No. 1 = 16°; No. 2 = 16°; No. 3 = 13°; and the cutting angle ground on the edge of the blades was: No. 1 = 40° No. 2 = 36°; No. 3 = 35° (see Figs. 5, 6, and 7).

Fig. 8.

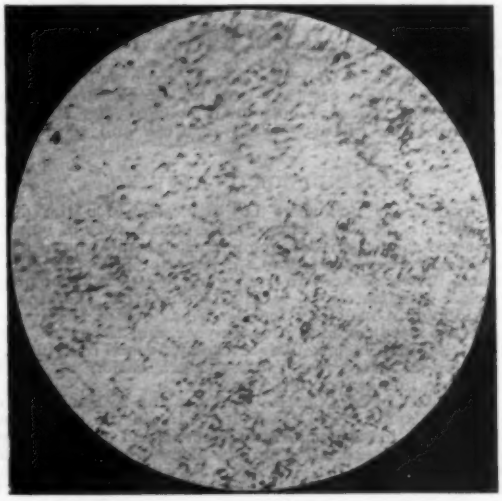


Fig. 8.—A photograph showing the microstructure (× 500) of one of the blades, which is typical of all three. The uniformity of the "pearlite" of stainless steel is evident.

† It is difficult to ascertain how these fallacies have been spread abroad. They may have arisen owing to the innate conservatism of some workmen, who frequently distrust a new material and will not take the trouble to learn either its composition or the proper method of working it. This would explain why so many stainless steel table-knives have been placed on the market with blunt edges, and from this fact have arisen the unfortunate ideas that stainless steel knives do not need sharpening, and that if they are sharpened they will become blunt at once. Experience has proved these suppositions to be incorrect. The writer has in his possession a stainless steel pocket-knife which he has used for all kinds of purposes, even to the cleaning out of tobacco-pipes, and yet it has retained a useful edge for two years.

Dr. Hatfield says that "one can rely upon retaining a hardness of 550 to 575 Brinell in stainless steel knives, and such knives are capable of keeping their edge when cutting through soft tissues of various kinds." If they encountered bone the edge might be expected to turn; and there is no doubt that such an encounter by an ordinary carbon-steel surgical knife hardened to 630–650 Brinell would also prove to the disadvantage of the knife.

After due trial it appears that the employment of blades of stainless steel is warranted for surgical and dental procedures, because such a course will mean a great economy of time and labour in cleaning and polishing instruments, and re-nickelling will be completely avoided. Stainless steel, suitably tempered, will also prove useful for similar reasons when employed for splints and in the manufacture of orthopædic apparatus.

THE ROYAL ALBERT INSTITUTION.

THE Royal Albert Institution for the Feeble-Minded held its twelfth quinquennial festival on Oct. 5th. The foundation-stone was laid in 1868 and the first patients were received in 1870. Since then 4407 patients have passed through the institution, and four out of every five have shown improvement, 10 per cent. becoming practically self-supporting. Of the 75 applicants for admission this year no fewer than 40 had lost one or both parents. Sir Robert Armstrong-Jones delivered the address at the Festival, and urged the pressing national importance of the care of the feeble-minded, lauding the devotion and altruism of those who devoted their lives to this service. The problem, he said, concerned the educationist, the socialist, and the sociologist; it was of urgent importance for welfare workers, for economists, and for statesmen. No illness could cause more distress and anxiety or cast such a shadow over a family. The origin of homes for mental defectives in this country was a series of articles which appeared in Chambers' Edinburgh Journal in 1847. They were written by Dr. Samuel Gaskell, subsequently a Commissioner in Lunacy, and described the work of Seguin at the Bicêtre, in Paris. As a result Dr. Andrew Reed had founded and opened Park House, Highgate, which had been the predecessor of Essex Hall, Colchester, now the Royal Eastern Counties Institution. This, in turn, had been the parent of the Royal Earlswood Institution, of which the Royal Albert was the daughter. Dr. Reed's foresight, wisdom, and enthusiasm had kindled a like zeal in great citizens of the north, and in the Royal Albert Institution the untaught, the undisciplined, and the uncared-for had been educated and trained to be helpful to themselves and useful to others. Tact, skill, and kindness had transformed the sullen, and coercion was unknown. The exhibition showed the extraordinary amount and variety of useful work which could be accomplished in an organised school of training, and also illustrated the high standard of industry attainable by patients who would otherwise lead idle lives, a source of trouble to their relatives, and of danger to the community.

The Royal Albert Institution has shown what can be done; the recent report of the Board of Control shows in vivid contrast what yet remains to be done. The country needs to be reminded of the codicil of Dr. Reed's will, which hangs in the entrance hall at Earlswood: "I bequeath the Four Asylums," he wrote, "to my beloved country, with an earnest prayer that they may be watched over with wisdom and benevolence—that they may be kept free from abuse, preserved in efficiency, and remain age after age Memorials of the Divine Charity which exalteth and glorifieth a People."

A HANDBOOK ON HANGING.

WHETHER or not there is justification for the death penalty in a modern civilised state is a matter of opinion. But there can be no two opinions that capital punishment should only be permitted as a deliberate policy; it is inexcusable if it is allowed to survive merely because of public inertia. Fortunately there is no doubt that the sense of individual responsibility for the behaviour of the State is becoming more common year by year, and the relationship of the State to the criminal, or the anti-social individual, is becoming a matter for earnest consideration among an increasing number of citizens.

The object of Mr. Charles Duff's satire, A Handbook on Hanging (Cayme Press), is no doubt to aid the propaganda for the abolition of capital punishment, and to some extent it succeeds. It certainly brings home the fact that an execution is a very dreadful affair for which each individual citizen is as responsible as if he had actually assumed the hangman's duties. At times the propagandist triumphs over the satirist—and it may be doubted whether wit, however bitter, is the medium of choice for dealing with this subject.

NATIONAL INSTITUTE FOR THE BLIND.

THIS year's annual report of the National Institute for the Blind (224, Great Portland-street, W. 1) is an encouarging account of its activities, illustrated by a remarkable series of photographs which help the reader to realise how much can be effected for blind children and adults by education, and especially by education of their hands.

The objects of the Institute are two: first to promote in every possible way the welfare of the blind from birth to old age, and secondly to coördinate national and local work so that the maximal amount of good is secured to the blind population of this country as a whole from all national and local bodies working on their behalf. In the former connexion are included the publication of embossed books, periodicals, and music; the preparation of Braille copies of text-books for blind students and the formation of a students' library, the maintenance of sunshine homes for blind babies, a college for blind girls, homes and hostels for blind women and students, the promotion of home industries and home workers and placing of the blind in industrial concerns, and the provision of all wireless facilities The coördination of national and local work is being furthered by unification of collation schemes, agreements for which have now been entered into with 67 local agencies for the blind in different parts of the country. These schemes, approved by the Ministry of Health, need to be applied for several years before their financial possibilities can be judged, but already, we are told, goodwill between the national and local bodies has been immensely fostered by them.

Included in the report is an interesting article on the Blind and Personal Service. There is a regrettable tendency to treat the blind as if their affliction carried with it some mental handicap, but this is by no means necessarily the case. As the writer remarks: "Who dare affirm from personal knowledge that the average blind man or woman of to-day with a knowledge of Braille is one whit behind in intelligence the average man or woman with sight who knows how to read?"

STERILISATION OF THE INSANE IN SWITZERLAND.

ON Sept. 3rd the following clause was added by the Grand Conseil of the Canton of Vaud, Switzerland, to the Cantonal Act regarding the insane:—

Art. 28 bis. Une personne atteinte de maladie mentale ou d'une infirmité mentale peut être l'objet de mesures d'ordre médical pour empêcher la survenance d'enfants, si elle est reconnue incurable et si, selon toutes prévisions, elle ne peut avoir qu'une descendance tarée.

L'intervention médicale n'a lieu que sur autorisation du conseil de santé.

Le conseil de santé lui-même ne donne cette autorisation qu'après enquête et sur préavis conforme de deux médecins désignés par lui.

Il décide de l'attribution des frais.

"THE IMPOTENCE OF MAN."

SCIENCE is sometimes reproached with being antagonistic to religion, and the first few chapters of Prof. Richet's book[1] may give colour to this complaint. Starting on a somewhat pessimistic note, he shows that man is trammelled by his environment; that, save in thought, gravity is our gaoler; and that the whole human race is but an imperceptible atom in the immense universe, while each human person is an insignificant fragment of the tiny human race. But we shall only have the right to bewail our lot, he says, when we reach the boundaries of knowledge, and these are still a long way off. Following this train of thought he deals in successive chapters with the impotence of the individual, impotence and happiness, intellectual impotence, physiological impotence (not, of course, in the technical sense), and moral impotence, his seeming pessimism giving place to optimism as he shows how the ego can rise superior to environment, and he works out a philosophy of life which may be summed up in the injunction, "Know thyself." The chapter on Moral Impotence is an analysis of human nature and its motives, and a plea for the mastery of self. "The more our personality is overwhelmed by cosmic, physiological, and social forces, the more it should strive to keep its sovereignty in its own little kingdom. There it rules alone." Indifference to small worries he holds to be a primordial virtue without which there is no true happiness, and he closes his book with the words, "And let us strive to make a little happiness round us, for happiness sends out beams like light, and whatever fools and knaves may say, our happiness depends on that of others."

The book is one which provides much food for thought.

[1] The Impotence of Man ("L'Homme Impuissant"). By Charles Richet, Professor of Physiology at the Faculté de Médecine, Paris. Nobel Prize for Physiology, 1913. Translated by Lloyd Harvey. London: T. Werner Laurie, Ltd. Pp. 150. 7s. 6d.